STANDARD FORM 299 (5/2009)
Prescribed by DOI/USDA/DOT
P.L. 96487 and Federal
Register Notice 5-22-95

APPLICATION FOR TRANSPORTATION AND UTILITY SYSTEMS AND FACILITIES ON FEDERAL LANDS

FORM APPROVED
OMB NO. 1004-0189
Expires: April 30, 2012

FOR AGENCY USE ONLY
Application Number
Date filed

NOTE: Before completing and filing the application, the applicant should completely review this package and schedule a preapplication meeting with representatives of the agency responsible for processing the application. Each agency may have specific and unique requirements to be met in preparing and processing the application. Many times, with the help of the agency representative, the application can be completed at the preapplication meeting.

1. Name and address of applicant *(include zip code)*

Invenergy Solar Development LLC
Suite 200
2580 W Main St.
Littleton, CO 80120

2. Name, title, and address of authorized agent if different from Item 1 *(include zip code)*

Laura Miner, Development Manager
Invenergy Solar Development LLC
(same address as applicant)

3. TELEPHONE *(area code)*
Applicant
303-797-5487
Authorized Agent
503-964-8900

4. As applicant are you? *(check one)*
   a. ☐ Individual
   b. ☐ Corporation*
   c. ☑ Partnership/Association*
   d. ☐ State Government/State Agency
   e. ☐ Local Government
   f. ☐ Federal Agency

   ** If checked, complete supplemental page*

5. Specify what application is for: *(check one)*
   a. ☑ New authorization
   b. ☐ Renewing existing authorization No.
   c. ☐ Amend existing authorization No.
   d. ☐ Assign existing authorization No.
   e. ☐ Existing use for which no authorization has been received*
   f. ☐ Other*

   **If checked provide details under Item 7*

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CARSON CITY
DISTRICT OFFICE
2013 AUG -1 PM 3:

6. If an individual, or partnership are you a citizen(s) of the United States? ☑ Yes ☐ No

7. Project description *(describe in detail)*: (a) Type of system or facility, *(e.g., canal, pipeline, road)*; (b) related structures and facilities; (c) physical specifications *(length, width, grading, etc.)*; (d) term of years needed; (e) time of year of use or operation; (f) Volume or amount of product to be transported; (g) duration and timing of construction; and (h) temporary work areas needed for construction *(Attach additional sheets, if additional space is needed.)*

a. This approximate 560 acre site is for a solar power generation facility consisting of ground-mounted solar photovoltaic panels; an electrical collection system connected to power inverter stations, and a project electrical substation. The legal description for the approximate 560 acre site is: T8N, R34E: Section 15: S2SW4; Section 15: S2S2; Section 21: N2N2; Section 22: N2N2 less about 7.5 acres of Hwy 361 ROW
b. A small operations and maintenance building, access roads within the site and a transmission line to the Table Mtn substation. The legal description for the transmission line is: Section 23: 150 ft line beginning 1,320 feet south from the NW corner of Sec 23, down the west boundary running diagonally about 3,600 feet to the Table Mtn substation in the SW 4 of Sec. 23. This area is about 12.3 acres in Sec 23.
c. Grading will be required for placement of the solar panels, inverter substations, electrical substation, and project roads. The foundations and underground collection system will require digging and trenching.
d. The term requested is 30 years.
e. In operation year round.
f. During the construction period the panels, inverters, substation equipment and electric transmission equipment will be transported to the site by truck. Once operational the plants output will be transmitted from the site to the existing NV Energy Table Mtn substation by the project's tline.
g. Construction is anticipated to take 4-8 months expected in latter part of 2014 or 2015.
h. Work areas would be on the site and for security purposes the site would be fenced.

8. Attach a map covering area and show location of project proposal

9. State or local government approval: ☐ Attached ☐ Applied for ☑ Not required

10. Nonreturnable application fee. ☐ Attached ☑ Not required

11. Does project cross international boundary or affect international waterways? ☐ Yes ☑ No *(If "yes," indicate on map)*

12. Give statement of your technical and financial capability to construct, operate, maintain, and terminate system for which authorization is being requested.

Invenergy Solar Development LLC is a wholly owned subsidiary of Invenergy LLC, the largest privately held developer, owner and operator of renewable energy projects in the United States. Invenergy has developed over 7,000 megawatts of clean energy projects in the US, including solar, wind and natural gas projects. A corporate summary document is attached to this application.

(Continued on page 2)

This form is authorized for local reproduction.

13a. Describe other reasonable alternative routes and modes considered.

Many prospective sites have been reviewed.. A viable solar project requires flat buildable land, a good solar resource, access to the transmission system, and land environmentally suited to energy development. The selected site was selected based on having all of the above criteria.

b. Why were these alternatives not selected?

There are very few alternatives; other sites did not possess this site's unique combination of constructability, solar resource, and proximity to a transmission substation in an area of minimal environmental impact.

c. Give explanation as to why it is necessary to cross Federal Lands

Because it is Federal Land surrounding the transmission access.

14. List authorizations and pending applications filed for similar projects which may provide information to the authorizing agency. *(Specify number, date, code, or name)*

BLM ROW: NVN 085215 - 2800 (NVC01 00)

15. Provide statement of need for project, including the economic feasibility and items such as: (a) cost of proposal *(construction, operation, and maintenance)*; (b) estimated cost of next best alternative; and (c) expected public benefits.

Solar power generation is clean, pollution free and competitive with other types of power generation such as wind, geothermal and gas turbines. a. Estimated cost is $100-150 million. b. Wind and natural gas facilities of this size have similar capital costs. c. Multiple public benefit of the project include economic and employment benefits associated with construction and operations; reduction in carbon production, air pollution, water use associated with electrical production; long term protection from fuel price volatility associated with other fuel sources.

16. Describe probable effects on the population in the area, including the social and economic aspects, and the rural lifestyles.

There will be a visual impact from the project ; it will generate construction jobs and long-term employment opportunities in the area operating plant. The project will generate very little day to day traffic on rural roads, and should create very few if any impacts on the rural lifestyle of the sorounding communities.

17. Describe likely environmental effects that the proposed project will have on: (a) air quality; (b) visual impact; (c) surface and ground water quality and quantity; (d) the control or structural change on any stream or other body of water; (e) existing noise levels; and (f) the surface of the land, including vegetation, permafrost, soil, and soil stability.

a. No air quality impact. b. Visual impacts will be minimal. The project will be visible from Hwy 95; however, there have been public presentations on the project's visual impact to Mineral County and a Special Use Permit for the project approved. c. the project will require minimal water use and not impact surface or groundwater d. not applicable e. no impact f. site vegetation is minimal, impacts will be negligible.

18. Describe the probable effects that the proposed project will have on (a) populations of fish, plantlife, wildlife, and marine life, including threatened and endangered species; and (b) marine mammals, including hunting, capturing, collecting, or killing these animals.

No impact

19. State whether any hazardous material, as defined in this paragraph, will be used, produced, transported or stored on or within the right-of-way or any of the right-of-way facilities, or used in the construction, operation, maintenance or termination of the right-of-way or any of its facilities. "Hazardous material" means any substance, pollutant or contaminant that is listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. 9601 et seq., and its regulations. The definition of hazardous substances under CERCLA includes any "hazardous waste" as defined in the Resource Conservation and Recovery Act of 1976 (RCRA), as amended, 42 U.S.C. 9601 et seq., and its regulations. The term hazardous materials also includes any nuclear or byproduct material as defined by the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq. The term does **not** include petroleum, including crude oil or any fraction thereof that is not otherwise specifically listed or designated as a hazardous substance under CERCLA Section 101(14), 42 U.S.C. 9601(14), nor does the term include natural gas.

None.

20. Name all the Department(s)/Agency(ies) where this application is being filed.

Only BLM

I HEREBY CERTIFY, That I am of legal age and authorized to do business in the State and that I have personally examined the information contained in the application and believe that the information submitted is correct to the best of my knowledge.

Signature of Applicant	Date
	07/29/2013

Title 18, U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious, or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 3)

GENERAL INFORMATION
ALASKA NATIONAL INTEREST LANDS

This application will be used when applying for a right-of-way, permit, license, lease, or certificate for the use of Federal lands which lie within conservation system units and National Recreation or Conservation Areas as defined in the Alaska National Interest Lands Conservation Act. Conservation system units include the National Park System, National Wildlife Refuge System, National Wild and Scenic Rivers System, National Trails System, National Wilderness Preservation System, and National Forest Monuments.

Transportation and utility systems and facility uses for which the application may be used are:

1. Canals, ditches, flumes, laterals, pipes, pipelines, tunnels, and other systems for the transportation of water.
2. Pipelines and other systems for the transportation of liquids other than water, including oil, natural gas, synthetic liquid and gaseous fuels, and any refined product produced therefrom.
3. Pipelines, slurry and emulsion systems, and conveyor belts for transportation of solid materials.
4. Systems for the transmission and distribution of electric energy.
5. Systems for transmission or reception of radio, television, telephone, telegraph, and other electronic signals, and other means of communications.
6. Improved rights-of-way for snow machines, air cushion vehicles, and all-terrain vehicles.
7. Roads, highways, railroads, tunnels, tramways, airports, landing strips, docks, and other systems of general transportation.

This application must be filed simultaneously with each Federal department or agency requiring authorization to establish and operate your proposal.

In Alaska, the following agencies will help the applicant file an application and identify the other agencies the applicant should contact and possibly file with:

U.S. Department of Agriculture
FOREST SERVICE (USFS)
Alaska Regional Office (Region 10)
Physical Address:
Federal Office Building
709 West 9th Street
Juneau, Alaska 99801
Mailing Address:
P.O. Box 21628
Juneau, Alaska 99802
Telephone: 907-586-8806

U.S. Department of the Interior
BUREAU OF INDIAN AFFAIRS (BIA)
Alaska Regional Office (Juneau)
Mailing/Physical Address:
P.O. Box 25520
709 West 9th Street
Juneau, Alaska 99802
Telephone: 800-645-8397

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT (BLM)
Alaska State Office
Mailing/Physical Address:
222 West 7th Avenue #13
Anchorage, Alaska 99513
Telephone: 907-271-5960

U.S. Department of the Interior
NATIONAL PARK SERVICE (NPS)
Alaska Regional Office (Anchorage)
Mailing/Physical Address:
240 West 5th Avenue, Room 114
Anchorage, Alaska 99501
Telephone: 907-644-3501

U.S. Department of the Interior
FISH AND WILDLIFE SERVICE
Alaska Regional Office (Region 7)
Mailing/Physical Address:
1011 East Tudor Road
Anchorage, Alaska 99501
Telephone: 907-271-5011

Note: Filings with any Department of the Interior agency may be filed with any office noted above or with the:

U.S. Department of the Interior
OFFICE OF ENVIRONMENTAL POLICY AND COMPLIANCE
Alaska Regional Office (Anchorage)
Regional Environmental Officer
1689 C Street, Room 119
Anchorage, Alaska 99501
Telephone: (907) 271-5011

U.S. Department of Transportation
FEDERAL AVIATION ADMINISTRATION
Alaska Regional Office (Anchorage)
222 West 7th Avenue, #14
Anchorage, Alaska 99513
Telephone: 907-271-5269

NOTE - The Department of Transportation has established the above central filing point for agencies within that Department. Affected agencies are: Federal Aviation Administration (FAA), Coast Guard (USCG), Federal Highway Administration (FHWA), Federal Railroad Administration (FRA).

OTHER THAN ALASKA NATIONAL INTEREST LANDS

Use of this form is not limited to National Interest Conservation Lands of Alaska.

Individual departments/agencies may authorize the use of this form by applicants for transportation and utility systems and facilities on other Federal lands outside those areas described above.

For proposals located outside of Alaska, applications will be filed at the local agency office or at a location specified by the responsible Federal agency.

SPECIFIC INSTRUCTIONS
(Items not listed are self-explanatory)

Item

7 Attach preliminary site and facility construction plans. The responsible agency will provide instructions whenever specific plans are required.

8 Generally, the map must show the section(s), township(s), and ranges within which the project is to be located. Show the proposed location of the project on the map as accurately as possible. Some agencies require detailed survey maps. The responsible agency will provide additional instructions.

9, 10, and 12 - The responsible agency will provide additional instructions.

13 Providing information on alternate routes and modes in as much detail as possible, discussing why certain routes or modes were rejected and why it is necessary to cross Federal lands will assist the agency(ies) in processing your application and reaching a final decision. Include only reasonable alternate routes and modes as related to current technology and economics.

14 The responsible agency will provide instructions.

15 Generally, a simple statement of the purpose of the proposal will be sufficient. However, major proposals located in critical or sensitive areas may require a full analysis with additional specific information. The responsible agency will provide additional instructions.

16 through 19 - Providing this information in as much detail as possible will assist the Federal agency(ies) in processing the application and reaching a decision. When completing these items, you should use a sound judgment in furnishing relevant information. For example, if the project is not near a stream or other body of water, do not address this subject. The responsible agency will provide additional instructions.

Application must be signed by the applicant or applicant's authorized representative.

If additional space is needed to complete any item, please put the information on a separate sheet of paper and identify it as "Continuation of Item".

(For supplemental, see page 4)

SUPPLEMENTAL

NOTE: The responsible agency(ies) will provide additional instructions	CHECK APPROPRIATE BLOCK	
I - PRIVATE CORPORATIONS	ATTACHED	FILED*
a. Articles of Incorporation	☐	☐
b. Corporation Bylaws	☐	☐
c. A certification from the State showing the corporation is in good standing and is entitled to operate within the State.	☐	☐
d. Copy of resolution authorizing filing	☐	☐
e. The name and address of each shareholder owning 3 percent or more of the shares, together with the number and percentage of any class of voting shares of the entity which such shareholder is authorized to vote and the name and address of each affiliate of the entity together with, in the case of an affiliate controlled by the entity, the number of shares and the percentage of any class of voting stock of that affiliate owned, directly or indirectly, by that entity, and in the case of an affiliate which controls that entity, the number of shares and the percentage of any class of voting stock of that entity owned, directly or indirectly, by the affiliate.	☐	☐
f. If application is for an oil or gas pipeline, describe any related right-of-way or temporary use permit applications, and identify previous applications	☐	☐
g. If application is for an oil and gas pipeline, identify all Federal lands by agency impacted by proposal.	☐	☐
II - PUBLIC CORPORATIONS		
a. Copy of law forming corporation	☐	☐
b. Proof of organization	☐	☐
c. Copy of Bylaws	☐	☐
d. Copy of resolution authorizing filing	☐	☐
e. If application is for an oil or gas pipeline, provide information required by Item "I-f" and "I-g" above.	☐	☐
III - PARTNERSHIP OR OTHER UNINCORPORATED ENTITY		
a. Articles of association, if any	☐	☑
b. If one partner is authorized to sign, resolution authorizing action is	☐	☐
c. Name and address of each participant, partner, association, or other	☐	☑
d. If application is for an oil or gas pipeline, provide information required by Item "I-f" and "I-g" above.	☐	☐

* If the required information is already filed with the agency processing this application and is current, check block entitled "Filed." Provide the file identification information (e.g., number, date, code, name). If not on file or current, attach the requested information.

(Continued on page 5)

NOTICES

NOTE: This applies to the Department of the Interior/Bureau of Land Management (BLM).

The Privacy Act of 1974 provides that you be furnished with the following information in connection with the information provided by this application for an authorization.
AUTHORITY: 16 U.S.C. 310 and 5 U.S.C. 301.
PRINCIPAL PURPOSE: The primary uses of the records are to facilitate the (1) processing of claims or applications; (2) recordation of adjudicative actions; and (3) indexing of documentation in case files supporting administrative actions.
ROUTINE USES: BLM and the Department of the Interior (DOI) may disclose your information on this form: (1) to appropriate Federal agencies when concurrence or supporting information is required prior to granting or acquiring a right or interest in lands or resources; (2) to members or the public who have a need for the information that is maintained by BLM for public record; (3) to the U.S. Department of Justice, court, or other adjudicative body when DOI determines the information is necessary and relevant to litigation; (4) to appropriate Federal, State, local, or foreign agencies responsible for investigating, prosecuting violation, enforcing, or implementing this statute, regulation, or order; and (5) to a congressional office when you request the assistance of the Member of Congress in writing.
EFFECT OF NOT PROVIDING THE INFORMATION: Disclosing this information is necessary to receive or maintain a benefit. Not disclosing it may result in rejecting the application.

The Paperwork Reduction Act of 1995 requires us to inform you that:
The Federal agencies collect this information from applicants requesting right-of-way, permit, license, lease, or certifications for the use of Federal Lands.
Federal agencies use this information to evaluate your proposal.
No Federal agency may request or sponsor and you are not required to respond to a request for information which does not contain a currently valid OMB Control Number.

BURDEN HOURS STATEMENT: The public burden for this form is estimated at 25 hours per response including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to: U.S. Department of the Interior, Bureau of Land Management (1004-0189), Bureau Information Collection Clearance Officer (WO-630) 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

A reproducible copy of this form may be obtained from the Bureau of Land Management, Division of Lands, Realty and Cadastral Survey, 1620 L Street, N.W., Rm. 1000 LS, Washington, D.C. 20036.

LUNING SOLAR ENERGY PROJECT

PLAN OF DEVELOPMENT

BLM Case Number NVN 092243

Prepared for:

Bureau of Land Management
Stillwater Field Office
5665 Morgan Mill Road
Carson City, Nevada 89701

Prepared by:

SWCA Environmental Consultants
7210 Placid Street
Las Vegas, Nevada 89119

SWCA Project No. 27098

October 14, 2013

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1.0 PROJECT DESCRIPTION

1.1 Introduction

Invenergy Solar Development LLC (Invenergy Solar) is applying for a right-of-way (ROW) grant to construct, operate, and maintain a solar energy project (Project) on public land managed by the Bureau of Land Management (BLM). The Project would be located on 560 acres (Project boundary) in Mineral County, Nevada, approximately 3 miles north of Luning, Nevada, on U.S. Route 95 (U.S. 95) and Nevada State Route 361 (SR 361) (Figure 1). The Project would be capable of producing approximately 140,000 megawatt-hours (MWh) of renewable energy annually with a gross capacity of 50 megawatts (MW) alternating current (ac). In 2009, Luning Solar Energy LLC completed a Plan of Development (POD), and the BLM completed an environmental assessment (EA) and issued a finding of no significant impact (FONSI) and ROW for a solar project at this same location. Since then, Luning Solar Energy LLC has relinquished this ROW and Invenergy Solar has submitted a Standard Form 299 (SF-299) ROW application to the BLM. This POD is being submitted to the BLM by Invenergy Solar to support this new ROW application.

The Project would use ground-mounted solar panels. Associated with the Project would be an electrical collection system connecting power inverters and transformers to the Project's collector substation where the collection system voltage would be increased to 120 kilovolts (kV). A 120-kV generation-tie transmission line (gen-tie line) would connect the Project to the existing Table Mountain substation, which is owned by NV Energy and is approximately one mile from the Project. A control house next to the collector substation would house protective relays and communications infrastructure.

The Project is projected to take approximately 30 months from permitting to commercial operation; Table 1 provides a preliminary schedule.

Table 1. Preliminary Schedule

Activity	Date
Project permitting	Summer–Winter 2013
Receive BLM ROW grant	Spring 2014
Finalize interconnect agreement	Winter 2014
Receive BLM Notice to Proceed	Spring 2015
Complete Project financing	Spring 2015
Contractor selection	Summer 2015
Project construction	Summer–Winter 2015
Commercial operation	Beginning 2016– Beginning 2046
Construction reclamation	Winter 2015–TBD

Invenergy Solar has compiled this POD with, to the best of its knowledge, currently available information. This document is subject to change and will be modified as new information becomes available and as design drawings are brought closer to the final version.

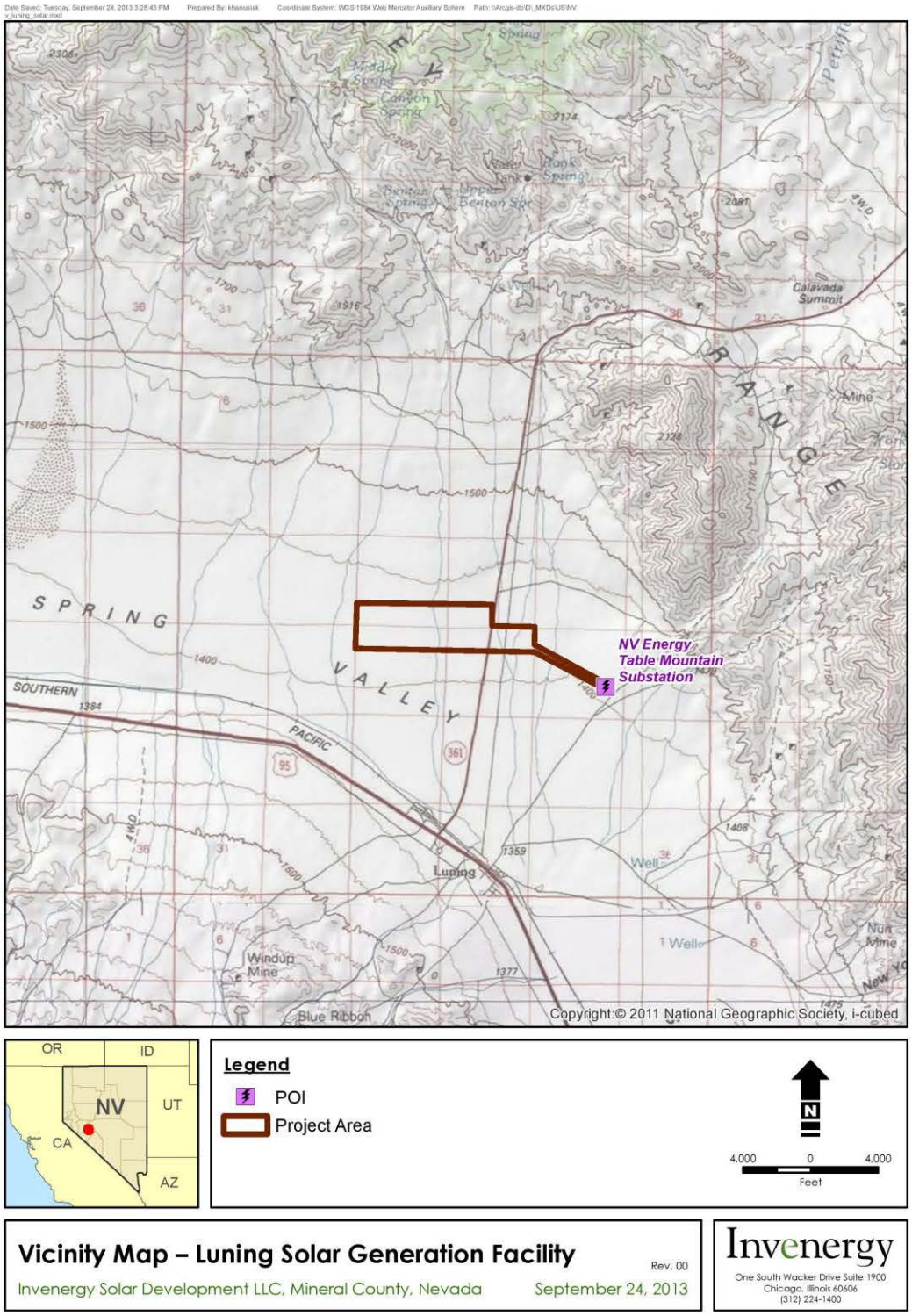

Figure 1. Project location map.

1.2 Proponent's Purpose and Need for the Project

The purpose of this Project is to provide a source of environmentally clean, renewable electricity that helps fulfill the needs of national and state renewable energy policies.

Federal laws and orders issued beginning in 2001 have established requirements for the BLM related to renewable energy development. Executive Order 13212, signed in 2001, states that "the increased production and transmission of energy in a safe and environmentally sound manner is essential to the well-being of the American people...[and] that agencies shall take appropriate actions, to the extent consistent with applicable law, to expedite projects that will increase the production, transmission, or conservation of energy" (U.S. General Services Administration 2001). The Energy Policy Act of 2005 set a 10-year target for the Secretary of the Interior to approve at least 10,000 MW of non-hydropower renewable energy projects located on public lands (BLM 2013). These laws and orders led to, among other things, the BLM issuing a Solar Energy Development Policy in 2007 and then the Final Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (PEIS) and the associated ROD (BLM 2012).

The State of Nevada has also recognized the need for new and diverse energy resources, including renewable energy generation. The Nevada Renewable Portfolio Standard (Nevada Revised Statutes [NRS] 704.7821) was revised on July 1, 2009, by Senate Bill 358 to state that by calendar year 2025, no less than 25% of the total amount of electricity sold by NV Energy to its retail customers in Nevada must be from renewable energy resources. Additionally, a solar "carve-out" states that beginning in 2016, at least 6% of the energy should be solar. More recently, Nevada passed Senate Bill 123 in June 2013 requiring NV Energy to retire at least 800 MW of coal-fired electric generating capacity by the end of 2019 and replace this with at least 350 MW from renewable energy (Nevada Legislature 2013). NV Energy will issue requests for proposals (RFPs) to acquire 300 MW of this renewable energy by the end of years 2014, 2015, and 2016 (Nevada Legislature 2013).

Similarly, the State of California has recognized the need for new and diverse energy resources, including renewable energy generation. Governor Schwarzenegger signed Executive Order S-14-08 on November 17, 2008, which established California's goal of increasing renewable energy–generated electricity. On April 12, 2011, Governor Jerry Brown signed legislation (Senate Bill X 1-2) to require one-third of the state's electricity to come from renewable energy by December 31, 2020.

1.3 General Facility Description, Design, and Operation

1.3.1 Project Location, Land Ownership and Jurisdiction

The Project is located in Mineral County approximately three miles north of Luning, Nevada, on U.S. 95 and SR 361 (see Figure 1). Luning is 160 miles southeast of Reno and 290 miles northwest of Las Vegas. All of the Project facilities are located on public lands administered by the BLM (Figure 2).

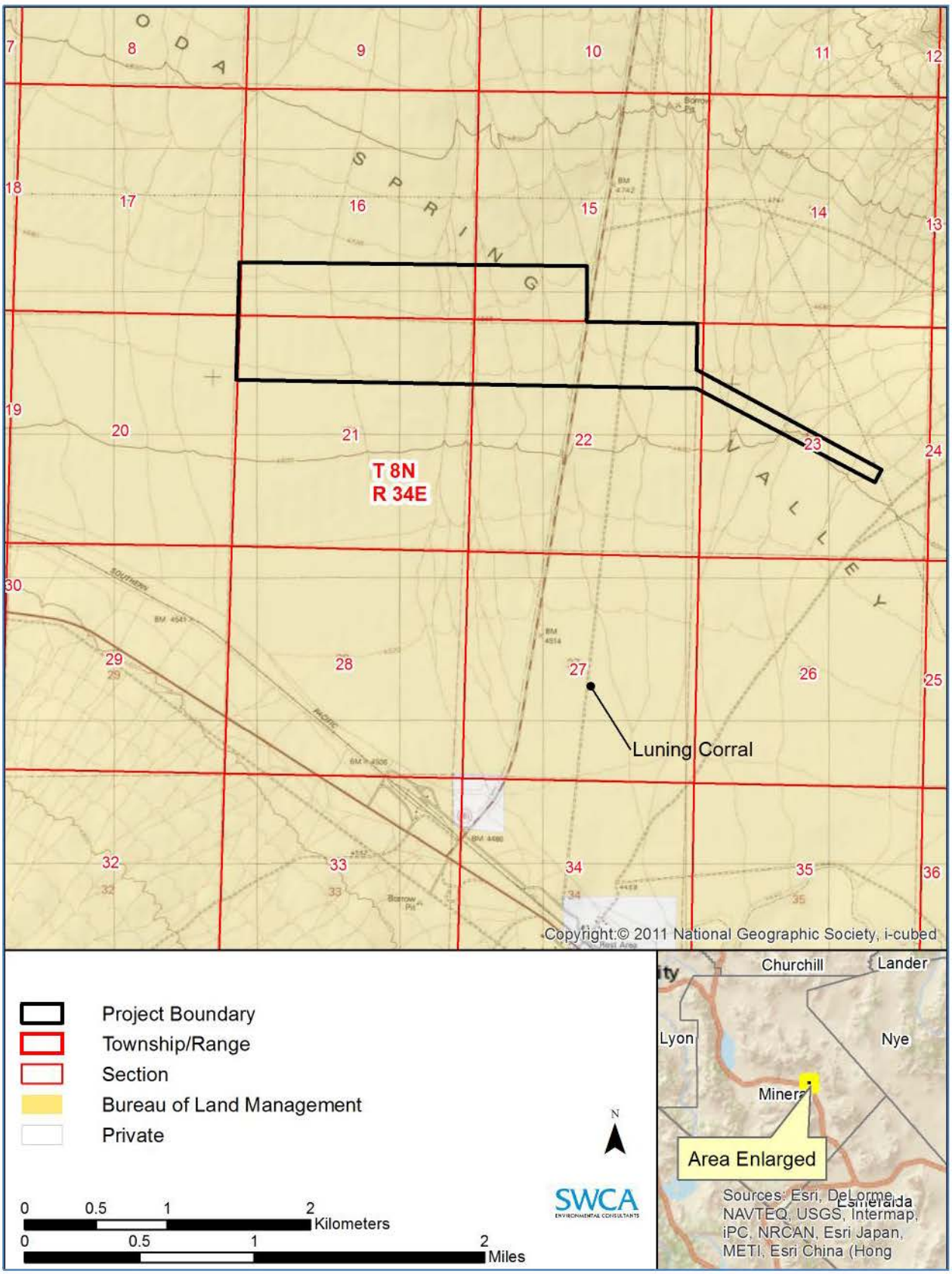

Figure 2. Landownership surrounding the Project.

1.3.2 Legal Land Description of Facility (federal and non-federal lands)

The legal description for the 560-acre Project boundary (all on federal land) is as follows:

- T8N, R34E, Section 15, S½ SW¼ (all 80 acres);
- T8N, R34E, Section 16, S½ S½ (all 160 acres);
- T8N, R34E, Section 21, N½ N½ (all 160 acres);
- T8N, R34E, Section 22, N½ N½ (all 160 acres less 7.5 acres of SR 361 ROW); and
- T8N, R34E, Section 23, (60-ft wide gen-tie ROW beginning ¼ mile from the NW corner of Section 23, running diagonally southeast approximately one mile to the Table Mountain substation in the SW¼ of Section 23, which is 7.5 acres).

1.3.3 Total Acreage and General Dimensions of All Facilities and Components

Within the 560-acre Project boundary, the Project will have short-term land disturbance effects during construction and lesser long-term land disturbance effects during operations (see Table 2). The acreage that is not needed for operations will be reclaimed (see Section 2.12). Figure 3 shows the short-term and long-term Project footprint as proposed. Detailed drawings are available in the engineering and civil design package (Appendix A).

Table 2. Project Disturbance Summary

Facility Component	Short-Term Disturbance (acres)	Long-Term Disturbance (acres)
Solar Field (including solar arrays, access roads, underground collection system, control house, laydown yard, and collector substation)	552.50	435.50
SR 361 crossing[1] (including underground collection system and access roads)	0.30	0.15
Gen-tie[2]	7.20	0.01
TOTAL	560.00	435.66

1. Assumes 20-ft wide Project access road within 400-ft wide SR 361 ROW, no disturbance to SR 361 itself, and short-term disturbance will be 2x long-term.
2. Assumes 10 poles with 100-ft radius construction circles and 3-ft radius operation circles within 60-ft wide gen-tie ROW and drive and crush vehicle traffic only (meaning no temporary or permanent road).

1.3.4 Power Plant Facilities, Thermal Conversion Process

The Project would generate electricity using multiple arrays of solar panels connected to electrical infrastructure and transmitted via a gen-tie line to the interconnection point (see Sections 1.3.5, 1.3.15 and 1.3.16 for more information).

Solar panels generate electricity using the photoelectric effect whereby the materials in the panels absorb the sun's energy in the form of photons and release electrons. The capture of these free electrons produces an electrical current that can be collected and supplied to the electrical power grid.

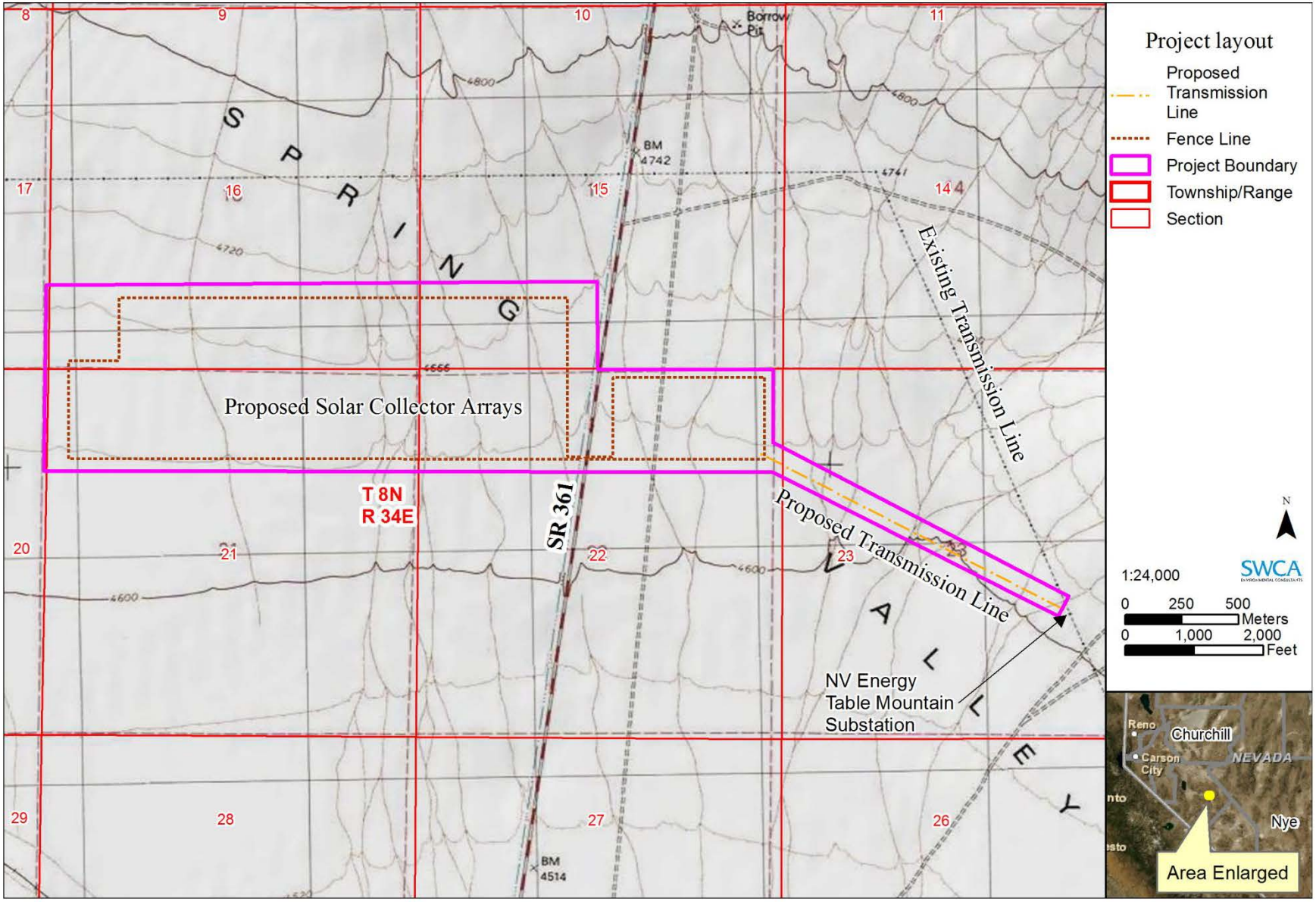

Figure 3. Project footprint.

1.3.5 Numbers and General Dimensions of Solar Array, Power Generation Units (wet or dry cooling), Towers, Substations, Transmission Lines, Access Roads, Buildings, and Parking Areas

Given the preliminary schedule, materials have not yet been procured nor have final decisions been made on specific manufacturers or designs. However, for planning purposes, an engineering and civil design package (see Appendix A) has been developed that assumes the Project would consist of the following:

- 210,000 solar modules;
- 85,000 linear feet of new access roads;
- a 300-square-foot control house;
- a 300-square-foot operations storage trailer;
- a 2,500-square-foot collector substation;
- a 15,000-square-foot temporary construction laydown yard; and
- 1 mile of overhead 120-kV gen-tie line.

The solar panel specification used for this design is a 72-cell, 300-watt multicrystalline module using a single axis tracker. The Project would use a design manufactured by Trina or a comparable firm (Appendix B). Each module measures 6.42 × 3.25 feet and would be placed in a rack with 10 to 30 other modules and mounted approximately 2 feet off the ground on a single axis tracker that rotates 45 degrees to the east and west. The Project would use a rack manufactured by Array Technologies or a comparable firm (Appendix C). Each rack would be supported by steel posts; post depth would vary depending on soil conditions but are typically 10 to 15 feet below the surface. If soil conditions require it, concrete foundations would be used. Approximately 4,200 modules would be placed along with perimeter and interior access roads, inverters and transformers to form fifty 1MWac blocks (each block would measure approximately 726 × 456 feet). Racks of modules would be installed with enough spacing between rows to minimize row-to-row shading; the planned ground coverage is approximately 33%. Figure 4 provides an example of a typical installed solar panel array.

Figure 4. Sample solar panel array.

The power would be transmitted from the solar array through electrical infrastructure to the collector substation (see Section 1.3.15 for a thorough description). At that point, it would be transmitted via the overhead 120-kV gen-tie line to the Table Mountain substation (see Section 1.3.16). The gen-tie line would be mounted on approximately ten steel or wooden poles which would be between 60 and 90 feet tall and have a 3-ft radius footprint.

1.3.6 Temporary Construction Workspace, Yards, and Staging Areas

A 15,000-square-foot laydown yard for staging and storage during construction would be located next to the collector substation (see Appendix A). In addition to providing a temporary storage space for equipment and vehicles during construction, the laydown yard would be used to house approximately five office trailers during construction for Project management purposes. Portable toilets would be used by construction workers and visitors.

1.3.7 Geotechnical Studies and Data Needs, Including Solar Insolation Testing

No on-site insolation measurement data are available. However, data from the National Renewable Energy Laboratory indicate that the site is very suitable for solar power generation (Figure 5).

The geotechnical study is forthcoming.

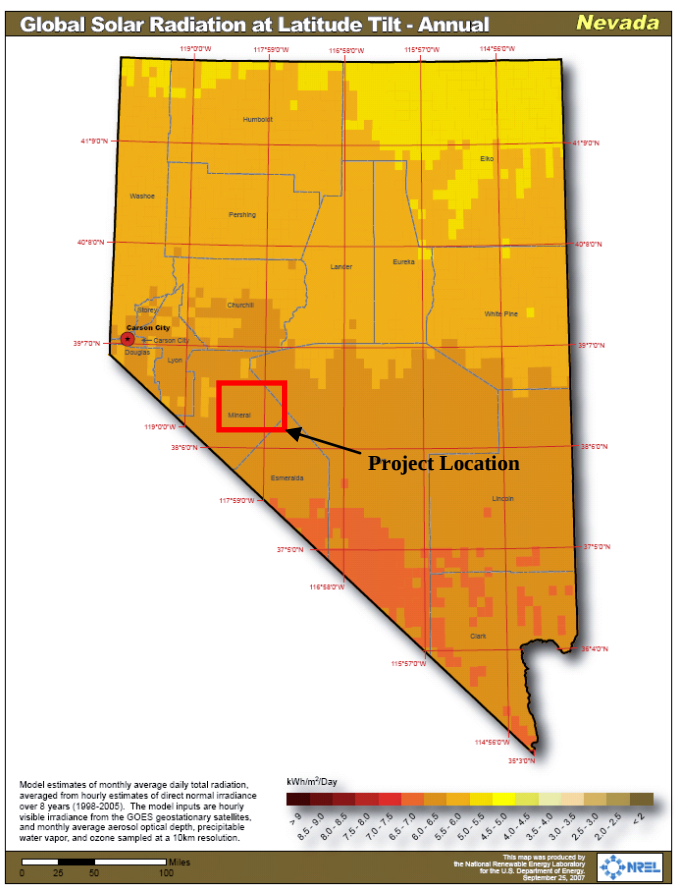

Figure 5. Solar resource map (National Renewable Energy Laboratory 2007).

1.3.8 Ancillary Facilities (administrative and maintenance facilities and storage sites)

The Project would have a control house that would sit next to the collector substation (see Appendix A) for the purpose of storing the Project's protective relay and communications equipment. It would also store potable water and Project documents for technicians. The control house would be a custom designed weatherproof structure with exterior walls and interlocking roof panels. The structural base and floor would be designed for applicable loading allowing the structure to be lifted and transported with most of the interior equipment installed and would be approximately 300 square feet. The control house would have fire and safety equipment such as smoke detectors, fire extinguishers, and an eyewash station. The control house would come with a heating and ventilation and air conditioning (HVAC) system. The HVAC system and other equipment in the control house would be powered with station power (see Section 1.3.15).

Two portable toilets would be located outside the control house to be used by maintenance technicians and visitors. A 300-square-foot storage trailer would be located next to the control house to store spare parts, consumables and tools for ongoing operations and maintenance. Maintenance trucks and personal vehicles would park adjacent to the control house.

1.3.9 Water Usage, Amounts, and Sources (during construction and operations)

Approximately 20 gallons of potable water would be stored on-site for use as drinking water during construction and operations. This water would be stored in the office trailers during construction and in the control house during operations.

Some water would be needed for site preparation and grading activities. During earthwork for the grading of access roads and other Project components, the main use of water is for compaction and dust control. Some water would be required for reclamation and for preparation of any concrete required for foundations. The total amount of water needed during construction would be less than three million gallons (9.2 acre-feet).

During operations, solar panel washings are planned to increase the average optical transmittance of the flat panel surface. Panel washes would be scheduled depending on actual soiling conditions, Project performance, and in accordance with the power purchase agreement. The demand for water to wash the panels would be less than one-quarter million gallons (0.75 acre-feet) per wash.

All water would be brought in from off-site sources as needed. The closest bulk water source is the Hawthorne Utilities stand pipe in Luning, approximately three miles from the Project. Seasonal freezing during October through March may require hauling water 22 miles from Hawthorne, Nevada, if needed during those months. Water for site preparation, grading, concrete, dust control and panel washings would be brought by 3,500-gallon water trucks, whereas potable water would be transported in 5-gallon containers.

1.3.10 Erosion Control and Stormwater Drainage

The Project design includes minimal grading in order to maintain existing stormwater drainage patterns (see Appendix A). Any erosion during construction would be controlled by implementing a Stormwater Pollution Prevention Plan (SWPPP), as required by the Nevada Department of Environmental Protection (NDEP), Bureau of Water Pollution Control for projects disturbing more than one acre.

1.3.11 Vegetation Treatment and Weed Management

No noxious weeds were observed during a vegetation survey conducted in June 2008; however, invasive non-native species are common (JBR Environmental Consultants [JBR] 2008). Russian thistle (*Salsola tragus*) is found throughout the area, and halogeton (*Halogeton glomeratus*) is common near SR 361. Cheatgrass (*Bromus tectorum*) is present in the area but is much less common than either Russian thistle or halogeton. Land clearing could result in the spread of Russian thistle or halogeton because these species are already common and frequently colonize newly disturbed areas. Any new infestations of non-native, invasive species in the Project area would be treated promptly, and any introduction of noxious weed infestations would be prevented using measures developed in consultation with the BLM.

1.3.12 Waste and Hazardous Materials Management

Locally generated trash during construction and operations would be hauled off-site for disposal.

There are two main sources of hazardous materials: padmount transformers and inverters. Each padmount transformer contains approximately 500 gallons of oil and each inverter cooling system contains approximately 11 gallons of ethylene glycol/water mixture, totaling 25,550 gallons of hazardous liquid at this Project. These hazardous materials would be managed in accordance with applicable state and federal regulations.

Section 40 Code of Federal Regulations (CFR) Part 112 requires that a Spill Prevention Control and Countermeasure (SPCC) plan be prepared for a project that stores oil in quantities greater than 1,320 gallons above ground and/or 42,000 gallons below ground. Therefore, a SPCC would be prepared for the Project to address any spills that could occur following guidelines in 40 CFR 112.

The construction contractor would also develop a SPCC to comply with Invenergy Solar standards that would address any spills during the construction period.

1.3.13 Fire Protection

Vegetation in the Project area is sparse enough that the risk of wildfire is relatively low. The solar modules are designed to be resistant to fire and the racks are constructed of non-combustible steel and aluminum. The solar panels and other electrical equipment would meet applicable Underwriters Laboratories and International Electrotechnical Commission (IEC) ratings for their resistance to fire. Specifically, the modules are IEC 61730 certified, which requires tests to assess the potential fire hazard due to operation of a module or failure of its components. Tests are conducted associated with temperature, hot spots, fire resistance bypass diode thermal, and reverse current overload in order to certify the panels. The solar modules themselves do not distribute heat to the surrounding area.

Fire extinguishers would be available in the control house and at strategic locations throughout the Project site. Roads have been designed and would be constructed and maintained to allow rescue vehicles to access the Project.

1.3.14 Site Security and Fencing (during construction and operations)

A 6-foot-high chain link fence would be installed around facilities as they are constructed, and access to the site would be controlled by gates (see Appendix A). High voltage equipment would be separately fenced with warning signage. Motion-activated lighting would be installed on the control house, on the access gates, and throughout the solar arrays for access during non-daylight hours. A motion-activated

security camera system would be installed with the lighting to monitor the collector substation, control house, and the solar arrays. During construction, temporary lighting facilities may be used if necessary.

1.3.15 Electrical Components, New Equipment, and Existing System Upgrades

Solar modules are connected in series to form strings, and electricity from these strings is aggregated in combiner boxes (see figure on Sheet W-111 of Appendix A). A single circuit then leaves each combiner box, which is installed underground and connects to the inverter.

The current produced by solar modules is in the form of direct current (DC). In order to be sent to the electrical grid, the DC current must be converted into AC power, and inverters serve this function. The conversion is accomplished by rapidly switching the DC power supply. By varying the length of time that the switch is on, as well as the polarity, the positive and negative swells of an AC wave are created. This waveform is then smoothed with an output filter. Inverters employ several advanced control systems, switching algorithms, and ancillary services for both the input and output stages. For the input stage, the inverters can manipulate the DC voltage to ensure maximum power harvest of input, and on the output various sensors ensure that AC power production is in accordance with regulatory requirements. The Project plans to use fifty General Electric (GE) Brilliance or similar inverters (Appendix D). The GE inverter is the latest evolution of power electronics designed with the heritage of GE's vast fleet of wind turbine inverters. The GE inverter is designed to fully comply with the applicable requirements of the National Electrical Code and Institute of Electrical and Electronics Engineers standards.

The inverter AC output voltage (480 volts) would then be stepped up to a higher voltage (34.5 kV) using padmount transformers located next to each inverter. Invenergy Solar has used Prolec GE transformers at many of its facilities and would use these or a comparable transformer for this Project (see Appendix E). Underground collection cables, buried to a minimum of 3 feet, would connect the electrical output to the Project collector substation. The cables would be arranged in several branch circuits, each circuit consisting of 34.5-kV three triplexed single conductor cables with PVC jackets that connect groups of solar modules to an open air isolation switch in the collector substation.

At the Project collector substation, the voltage would again be stepped up (from 34.5 to 120 kV) to prepare it to connect to the grid at the Table Mountain substation. The collector substation would include several 34.5-kV branch circuit breakers in combination with open air type isolation switches to connect the collection system feeders to the main 34.5-kV substation bus, a 34.5-kV main bus open air isolation switch, a 34.5- to 120-kV step-up transformer, and a 120-kV circuit breaker and open air isolation switch. The collector substation would also include protective relay and metering equipment, utility and customer revenue metering, and a 34.5-kV to 480-volt station service transformer to provide power to the collector substation service load and the control house.

The power output would then flow through the 120-kV isolation switch at the Project collector substation onto an approximately 1-mile-long, single circuit 120-kV gen-tie line to the point of interconnection at the Table Mountain substation (see Section 1.3.16).

1.3.16 Interconnection to Electrical Grid

Connection to the electrical grid would be made at the Table Mountain substation. An Interconnection Feasibility Study was completed by NV Energy in November 2008 for 50 MW of interconnection at this same substation for Luning Solar Energy LLC. A System Impact Study was completed in October 2010 and a Facility Study was completed in November 2011. These studies concluded that no significant negative impacts would be imposed on the NV Energy transmission grid from the proposed

interconnection if it was constructed as proposed, and a Large Generator Interconnection Agreement (LGIA) was drafted in 2012. Invenergy Solar is now in the interconnection queue for 50 MW. NV Energy expects to complete the System Impact Study by April 2014 and the Facility Study by October 2014, after which a new LGIA can be drafted and executed.

1.3.17 Health and Safety Program

Potential safety issues for the Project include safe work practices, site security, emergency response procedures, fire control, heavy equipment use and transportation, traffic control, and others. A detailed and complete health and safety program that meets all requirements under the federal Occupational Safety and Health Administration regulations would be developed for the protection of both workers and the general public during the construction and operational phases of the Project. The health and safety program would be developed, implemented, and administered by the contractors during construction and by the owner during operations.

1.4 Alternatives Considered by Applicant

Because Luning Solar Energy LLC received a BLM ROW for a comparable project with mitigation measures at this location after finding no significant environmental impacts, Invenergy Solar did not consider alternative Project locations or sizes as part of the new application.

1.5 Other Federal, State, and Local Agency Permits Requirements

BLM permitting is required since the Project is being proposed on federal land managed by BLM, and this POD has been prepared to comply with BLM ROW regulations as set forth at 43 C.F.R. Pt. 2800, BLM Instruction Memorandum 2011-060 and various provisions described in the PEIS. Other federal, state and local agency involvement would be completed through the National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA) processes led by BLM and would include stakeholders such as the U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (USFWS), Nevada Department of Wildlife, and the Nevada State Historic Preservation Office (SHPO). Because the entire Project is located on federal land, local permitting jurisdiction is limited. Appropriate coordination with Mineral County will be undertaken when applicable. Table 3 lists permits and authorizations that may be required prior to the commencement of construction.

Table 3. Permits, Certifications, and Authorizations

Authorization	Status	Statutory Reference	Permit or Authorization Trigger
Federal			
BLM ROW	Submitted ROW application July 31, 2013 and this POD October 14, 2013.	Federal Land Policy and Management Act of 1976 (Public Law [PL] 94-579; 43 United States Code [USC] 1761–1771; 43 CFR 2800); NEPA (PL 91-190, 42 USC 4321−4347, January 1, 1970, as amended by PL 94-52, July 3, 1975; PL 94-83, August 9, 1975; and PL 97-258, 4[b], September 13, 1982)	Federal land, federal permit
BLM National Historic Preservation Act (NHPA) Compliance	Prior BLM consultation was undertaken with the Walker River Paiute Tribe and the Yomba Shoshone Tribe as part of the Section 106 process associated with the NEPA review for Luning Solar Energy LLC (2009 EA). There were no impacts to register eligible resources within the Project boundary.	NHPA (36 CFR Part 800)	Register eligible cultural resources on federal land
Endangered Species Act (ESA)	No listed, threatened, or candidate species are present.	ESA (PL 93-205, as amended by PL 100-478 [16 USC 1531, *et seq*.])	Section 7 consultation.
USFWS Migratory Bird Treaty Act (MBTA)	No permit available allowing take of migratory bird.	16 USC 703–711; 50 CFR Subchapter B	
Clean Water Act (CWA)	No U.S. waters or wetlands have been identified.	Section 404	Placement of dredged or fill materials in waters of the U.S. or wetlands requires a federal permit.
State			
Nevada SHPO	SHPO concurrence will be required for eligibility, effect and any treatment plan developed.		Consultation required under 36 CFR Pt. 800
NDEP Bureau of Air Pollution Control Surface Disturbance Air Permit	Dust control plan and process equipment emissions control plans will be prepared.	NRS 445B.210, Nevada Administrative Code (NAC) 445B.22037	Disturbance or covering 5 acres or more of land or its topsoil.
NDEP Clean Water Act, Section 402 National Pollutant Discharge Elimination System Notification for Stormwater Management during Construction	NOI will be submitted and SWPPP prepared prior to commencement of construction.	33 USC 1251 *et seq*.	Construction activities larger than 1 acre that would discharge stormwater runoff from the construction site into a municipal separate stormwater sewer system or into waters of the U.S.
Nevada Department of Transportation (NDOT) ROW Occupancy Permit	Permit will be obtained prior to commencement of construction.	NRS 408.423, 408.210, NAC 408	Construction within an NDOT ROW.
NDOT ROW Permanent Encroachment Permit	Permit application in process.		Permanent installations such as utilities within an NDOT ROW.
Nevada Department of Public Safety Uniform Permit (for Transportation of Hazardous Materials)	Permit will be obtained prior to commencement of construction.	NAC 459.979	Transportation of hazardous materials in a vehicle on a public highway.

1.6 Financial and Technical Capability of Applicant

Invenergy Solar is a wholly owned subsidiary of Invenergy LLC, the largest privately held developer, owner, and operator of renewable energy projects in the United States. Invenergy LLC has developed over 7,000 MW of utility-scale solar, wind and gas-fueled power generation projects in the United States, Canada, and Europe. This includes more than 5,500 MW of projects in operation and more than 1,500 MW under contract and in construction.

Invenergy LLC plans on using a project financing structure for this Project. The company has numerous examples of this successful approach based on the number and types of projects currently operating or under construction. Invenergy LLC has raised more than $10 billion of capital in support of renewable and gas generation project financings in the last 10 years. Various financing structures have been used with differing debt and tax equity participants. Invenergy LLC typically secures project financing after all of the major project development components are in place (i.e. power purchase agreement, interconnect agreement, lease agreement, construction agreement).

2.0 CONSTRUCTION OF FACILITIES

2.1 Solar Field Design, Layout, Installation, and Construction Processes

2.1.1 Solar Field Design and Layout

The solar panel arrays (as described in Section 1.3.5) would be oriented north to south and track the sun from east to west to optimize energy production. More information is available in Section 1.3.5 and the engineering and civil design package (see Appendix A).

2.1.2 Installation and Construction Processes

An engineering, procurement, and construction (EPC) contractor would be selected to complete construction of the Project. Construction of specific Project components would be completed by subcontractors under the direction of the EPC contractor and Invenergy Solar. The EPC contractor would prepare a construction plan that it and its subcontractors would follow that would provide detailed guidance on Project design, construction process, safety, permitting, schedule, and other related construction items.

Project construction would follow a progressive approach. Construction of the facility would begin with surveying and staking the construction limits. The site would then be graded and fenced with security fencing prior to installation of the roads, solar panels, inverters, collector substation, and control house. Construction of the gen-tie line would be completed last, before the facility is energized.

2.2 Approach to Construction and Operations

Several activities must be completed prior to the commercial operation date. The majority of the activities relate to equipment ordering lead-time, as well as design and construction of the facility. A construction schedule is shown in Table 4. Pre-construction, construction, and post-construction activities, some of which would occur concurrently, include:

- Finalize project design;
- Soil borings, testing, and analysis for proper foundation design and materials;
- Ordering of all necessary components, including solar modules, inverters, and padmount transformers;
- Survey to establish locations of structures and roadways;
- Construction of access roads to be used for construction and maintenance;
- Installation of rack foundations (vibratory or pile driving);
- Installation of racks;
- Installation and stringing of modules;
- Installation of underground cables;
- Construction of underground feeder lines;
- Design and construction of Project collector substation;

- Commissioning of modules and inverters; and
- Commencement of commercial operation.

Table 4. Construction Schedule

Activity	Timeframe
Contractor selection	1 month
Mobilization	1 week
Site survey and staking	1 week
Site grading and fencing	2 weeks
Solar array installation	7 months
Collector substation construction	1 month
Gen-tie line construction	1 month
Energize facility	1 week

Once commercial operation begins, it is expected to continue for 30 years. Invenergy Services LLC operates most projects that are owned by Invenergy LLC affiliate companies in the United States, and it is anticipated that Invenergy Services LLC would also operate this Project. Project management, including remote monitoring and control, is performed from Chicago, Illinois.

2.3 Access and Transportation System, Component Delivery, and Worker Access

Equipment deliveries and workers would have easy access to the site. The SR 361 turnoff from U.S. 95 is approximately one mile northwest of Luning, Nevada. The site is approximately two miles north on SR 361 from U.S. 95 (see Figure 1). That section of U.S. 95 has an annual average daily traffic (AADT) count of 2,900, and that section of SR 361 has an AADT count of 100 (Nevada Department of Transportation [NDOT] 2013).

New roads would facilitate access within the Project site; refer to the engineering and civil design package for location (Appendix A). The roads would be approximately twenty feet wide and have aggregate as cover, adequate to support the size and weight of construction, maintenance, and rescue vehicles. There would be access to the Project from SR 361 via two driveways, one on the west side of the highway and one on the east side. The NDOT ROW (BLM Serial Number NVCC 0021174) extends 200 feet on both sides of the SR 361 centerline. Facility setbacks, underground collection system cabling and access road designs are being completed in accordance with NDOT procedures as part of the NDOT ROW permanent encroachment permit (see Table 3). Any lane closure or other impacts to SR 361 during construction will be coordinated as part of the NDOT ROW temporary occupancy permit (see Table 3).

During the construction phase, several types of light and medium construction vehicles would travel to and from the site. Private vehicles would also be used by the construction personnel. At this time, Invenergy Solar estimates that there would be approximately 100 truck trips per day in the area during peak construction periods. The highest traffic volume would occur during the peak construction periods when the rack foundation posts, rack, and module assembly is taking place concurrently. Oversize and overweight loads are not expected.

During the operations phase, the peak traffic time will be during water haul truck trips for panel washing during which approximately 70 truck trips would be required. Routine maintenance will require one or two light-duty trucks.

Signs reminding construction and maintenance personnel to maintain low vehicle speeds will be posted throughout the Project in order to minimize dust and promote safety.

A 200-foot-wide temporary ROW would be needed for the approximately 1-mile-long gen-tie line. Within that ROW, a two-track construction access road would be designated for drive and crush travel. Drive and crush is vehicular travel to access a site without significantly modifying the landscape. Vegetation is crushed but not cropped and will likely re-sprout after temporary use is stopped. After construction, the permanent gen-tie ROW would be 60 feet wide, and access would be along the two-track road, using drive and crush during infrequent maintenance and inspection events. Figure 6 provides a diagram of the gen-tie line ROW and disturbance areas.

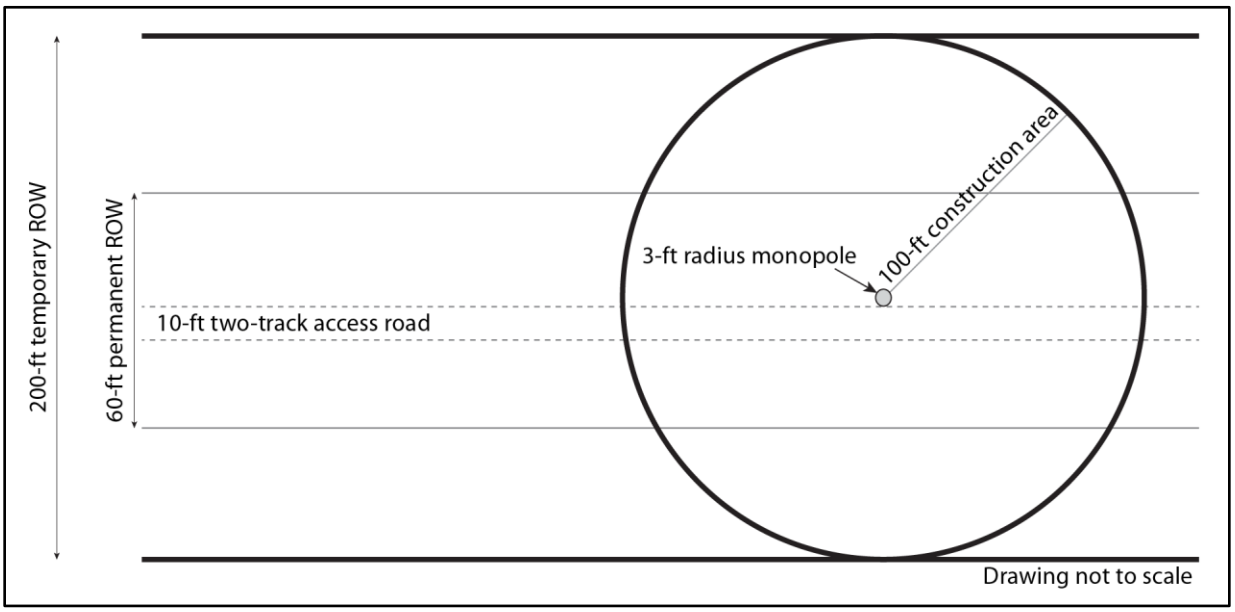

Figure 6. Gen-tie line ROW and disturbance area diagram.

2.4 Construction Work Force Numbers, Vehicles, Equipment, and Timeframes

Approximately 100 workers per day would be required for construction of the Project and associated facilities. Construction personnel would be from both the local labor force and from outside regions, with an emphasis placed on using local labor, contractors, and suppliers when possible. Temporary facilities, including office trailers and portable toilets, would be installed in the laydown area. No more than 100 employee vehicles are anticipated on the site at any one time.

Construction would generally occur between 7 a.m. and 7 p.m., Monday through Friday. Additional hours may be necessary to make up schedule deficiencies or to complete critical construction activities.

Equipment and vehicles that may be used during construction are listed in Table 5.

Table 5. List of Equipment Typically Used for Construction

Equipment	Use
D7 bulldozer	Road and pad construction
Grader	Road and pad construction
Water trucks	Compaction, erosion, and dust control
Roller/compactor	Road and pad construction
Backhoe	Digging foundations and trenches for utilities
Trenching machine	Digging trenches for underground utilities
Truck-mounted drill rig	Drilling pole foundations
Concrete trucks and pumps	Pouring pole and other structure foundations
Dump trucks	Hauling road and pad material
Flatbed trucks	Hauling towers and other equipment
Pickup trucks	General use and hauling minor equipment
Small hydraulic cranes and forklifts	Loading and unloading equipment
Four-wheel-drive all-terrain vehicles	Rough grade access and underground cable installation
Rough terrain forklifts	Lifting equipment
Crane	Framing and erecting poles
Pulling/braking equipment	Stringing and anchoring wires and conductors

2.5 Site Preparation, Surveying and Staking

Prior to construction a surveyor would obtain or calculate benchmark data, grades, and alignment of facilities based on information provided in the site plan. Benchmark data, grades, and alignment of facilities would be marked via control staking. The surveyor would re-establish and set additional control staking during construction.

2.6 Site Preparation, Vegetation Removal, and Treatment

Prior to commencement of earth-disturbing activity, Invenergy Solar (or its selected contractor) would identify any sensitive resources, such as cactus species, within the Project area. Sensitive resources would be marked with a global positioning system (GPS) unit, flagging, or other non-destructive method. Sensitive resources would be mitigated and/or removed from the Project area.

2.7 Site Clearing, Grading, and Excavation

Once site preparation is complete, the Project footprint would be cleared and grubbed of vegetation and debris using D7 or similar bulldozers. Cleared vegetation and debris suitable for compaction would be incorporated and/or stockpiled for later use while unsuitable materials, such as large rocks and boulders, would be stockpiled, then hauled off-site and disposed of.

Grading may require both excavation and soil compaction in order to achieve desired grades and elevations and ensure proper soil compaction as identified in the detailed design. Grading would be most extensive in areas for the access roads, control house, collector substation, and laydown yard, while grading would be minimized to the extent practicable for the solar array footprint. Stockpiling and grading would require the use of backhoes, graders, and rollers/compactors. Excavation for utility lines

and support structure foundations would be completed with truck-mounted drill rigs, backhoes, and trenching machines.

2.8 Solar Array Assembly and Construction

Solar array construction would begin with the installation support structures and foundations. The final support structure design is unknown at this time and would be determined by results of the geotechnical survey, the solar technology, and EPC contractor selected to complete construction.

Once foundations and support structures are in place, tracker assemblies would be constructed on-site and installed on the support structures. Final assembly of the trackers onto the support structures would require a variety of heavy equipment including small cranes, tractors, welding machines, and forklifts.

2.9 Gravel, Aggregate, and Concrete Needs and Sources

The quantities of construction materials required for the Project, such as gravel, aggregate (or road base), asphalt, and concrete, are dependent on the geotechnical study and final arrangements and layouts. These layouts would be part of the detailed design, and the material takeoffs would be estimated at that stage in the Project.

Preliminary studies indicate that the nearest processing plant for gravel and aggregate is at the intersection of U.S. 95 and SR 361. An alternate source is Corner Stone Ready Mix in Hawthorne, Nevada. Transportation fees associated with delivery of these materials must be considered, and alternative sources would be explored as further studies are conducted and construction needs become known.

2.10 Electrical Construction Activities

Installation of the collector substation would be done concurrent with the installation of solar trackers. Installation of the electrical infrastructure (as described in Section 1.3.15) would begin after the solar array structural installation is complete.

2.11 Aviation Lighting (power towers, transmission)

No towers, transmission lines, or structures would be tall enough to require aviation lighting.

2.12 Site Stabilization, Protection, and Reclamation Practices

After Project construction, any area that was temporarily disturbed and no longer needed for on-going operations will be reclaimed using a seed and plant mix as approved by the BLM. The greatest area to be reclaimed would be along the gen-tie route.

At the end of the useful life of the Project, or upon the expiration or termination of the ROW grant, whoever comes first, the solar panels and all ancillary equipment and facilities (including control house, portable toilets, collector substation, gen-tie) would be removed from the site. Any support structures would be demolished and all debris would be removed. After removal of all equipment and structures, the ground and roads would be smoothed by disking and planted with a seed and plant mix as approved by the BLM. These practices would be described in more detail in a forthcoming Decommissioning and Site

Reclamation Plan (DSRP). The DSRP would include a reclamation cost estimate using a methodology similar to the one used by the mining industry (NDEP 2013) in order to help the BLM establish a performance and reclamation bond amount to ensure the Project's compliance with the terms and conditions of the ROW authorization (BLM 2011a, 2012). Invenergy Solar would post the bond prior to receiving a Notice to Proceed.

3.0 RELATED FACILITIES AND SYSTEMS

3.1 Transmission Systems Interconnect

Connection to the electrical grid would be made at the Table Mountain substation via the Project's new 120-kV gen-tie line. The 2012 draft LGIA indicated that the change in ownership would occur just inside the Table Mountain substation fencing. At the pre-application meeting held with NV Energy and Invenergy Solar on September 17, 2013, it was determined that the substation fencing may need to be expanded in order to accommodate NV Energy's new facilities to interconnect the Project. NV Energy is in the process of determining whether its existing BLM ROW (BLM Serial Number NVN 007255) is sufficient to cover this expansion or whether it would need to amend its ROW, and subsequent information would be provided as part of this POD when that determination is made.

A 200-foot-wide temporary ROW would be needed for the approximately 1-mile-long gen-tie line. Within that ROW, 10 monopole structures would be erected. Each monopole would require a 100-foot-radius area for construction. Following construction, the permanent disturbance would be 3 feet around each monopole, and the temporary disturbance area would be reclaimed (see Section 2.12). Additionally, all necessary pulling and tensioning sites would be within the temporary 200-foot ROW and would be reclaimed following construction. Figure 6 above provides a diagram of the gen-tie line ROW and disturbance areas.

3.2 Gas Supply Systems

No gas supply systems would be required.

3.3 Other Related Systems

3.3.1 Communication System

On-site communications during the construction and operations phases of the Project would be accomplished with cellular telephones and two-way radios. Air horns may also be used for emergency communications as necessary.

Communications with NV Energy during the operations phase of the Project would be done using a primary and secondary fiber optic cable. The primary fiber optic line would be integrated with the gen-tie line while the secondary fiber optic line would be buried.

There would also be a Supervisory Control and Data Acquisition (SCADA) system such as the GE SunIQ system (see Appendix F) that allows Invenergy Services LLC on-site and remote personnel to operate the Project.

4.0 OPERATIONS AND MAINTENANCE

4.1 Operation and Maintenance Facility Needs

The control house and associated facilities (i.e., parking, storage trailer, and portable toilets) would accommodate operation and maintenance needs. Because the Project would not be staffed regularly, there would not be a separate operations and maintenance facility.

4.2 Maintenance Activities, Including Mirror Washing and Road Maintenance

On-site maintenance activities would include inspections, planned and unplanned maintenance, and panel washing. Inspections of the Project's electrical facilities, roads, and grounds would be conducted a minimum of one day per month. The equipment is modular and can be easily removed and replaced if necessary. Given the relatively small size, modules can be easily picked up with a small loader and placed on a flatbed truck. Preventative maintenance on the Project solar arrays and inverters would be conducted a minimum of twice per year. PV panel washings would occur as needed to increase the average optical transmittance of the flat panel surface (see Section 1.3.9). Some minor roadwork and weed control would be performed as needed.

4.3 Operations Workforce and Equipment

The Project would not utilize full-time on-site staff, but would be monitored 24 hours per day, 7 days per week via the SCADA system by Invenergy Services LLC. A minimum of two maintenance technicians would be dispatched during inspections, unplanned and planned maintenance, and panel washing. A special crew may be deployed for panel washing depending on the frequency. The two technicians and all contractors during the operations phase would be under the supervision of a regional Invenergy Services LLC operations and maintenance manager. Invenergy Services LLC provides competitive salaries, benefits, and training and strives to hire locally when possible.

Most of the maintenance equipment would be stored on-site in the control house, though some equipment and tooling would arrive from off-site with the technicians.

5.0 ENVIRONMENTAL CONSIDERATIONS AND OTHER RESOURCES

5.1 General Description of Site Characteristics and Potential Environmental Issues

The Project area occurs on a flat outwash fan in Soda Springs Valley. The area is sandy to gravelly and the limited vegetation consists of two dominant species, Shockley's wolfberry (*Lycium shockleyi*) and Bailey's greasewood (*Sarcobatus baileyi*) (JBR 2008).

Figure 7. Project area overview (Kautz 2009).

5.1.1 Special or Sensitive Species and Habitats

A Nevada Natural Heritage Program (NNHP) database query performed in August 2013 (NNHP 2013) identified no records of listed, candidate, or sensitive plant and animal species in the Project site. No state or federally listed plants or BLM sensitive plants were observed during a vegetation survey or NNHP query conducted in June and July 2008 (JBR 2008). Nine cacti were observed in the Project area during the June 2008 vegetation survey including six plains pricklypears (*Opuntia polyacantha*) and three sand chollas (*Grusonia pulchella*). All cacti species are protected from willful destruction under state law (NRS 527.060–527.120) (JBR 2008).

The USFWS online species list for Mineral County identifies five species: greater sage-grouse (*Centrocercus urophasianus*, candidate), yellow-billed cuckoo (*Coccyzus americanus*, candidate), Hiko White River springfish (*Crenichthys baileyi grandis*, endangered), Railroad Valley springfish (*Crenichthys nevadae*, threatened), and Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*, threatened) (USFWS). There is no suitable habitat for these species in the Project area.

Nevada Department of Wildlife online maps show that the Project area does not overlap sage-grouse habitat or big game habitat. It is possible that some BLM sensitive wildlife species such as various bats,

owls, and hawks would forage in the area but these species are unlikely to be negatively affected by the Project.

5.1.2 Special Land Use Designations

No special land use designations have been identified in the Project area.

5.1.3 Visual Resource Management Designations

Visual resources (the landscape) consist of landform (topography and soils), vegetation, bodies of waters (lakes, streams, and rivers), and human-made structures (roads, buildings, and modifications of the land, vegetation, and water). These elements of the landscape can be described in terms of their form, line, color, and texture. Normally, the more variety of these elements there is in a landscape, the more interesting or scenic the landscape becomes, if the elements exist in harmony with one another. The visual impact of projects is often raised as an issue during project development. The risk is determined by evaluating the existing landscape, including current structures and developments, the proximity to viewers with high sensitivity, and how the proposed Project would contrast with existing conditions.

BLM lands surrounding the Project site are unclassified and managed as visual resource management (VRM) Class IV. The objective of Class IV is to provide for management activities that require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of basic elements.

A BLM Visual Contrast Rating Worksheet was completed by JBR in 2009 for one key observation point (KOP) at the junction of U.S. 95 and SR 361. JBR's assessment concluded that the proposed buildings and solar arrays would create additional areas of contrast with the surrounding undisturbed landform and vegetation. The proposed transmission line to the existing Table Mountain substation would be indistinct and difficult to see. The overall contrast would be weak to moderate because the disturbance is two miles away from an observer at the KOP. Outside of daylight hours, the Project should not be visible from the KOP due to the limited use of lighting (see Section 1.3.14). It was determined that the Project meets VRM Class IV objectives.

5.1.4 Cultural and Historic Resource Sites and Values

The Project site was inventoried to federal Class III standards by Kautz Environmental Consultants, Inc. (Kautz), in June and July 2008 (Kautz 2009). This inventory identified six archaeological sites, all historic in age. Five of these resources are recommended not eligible for the National Register of Historic Places. The remaining resource is a segment of the Wadsworth to Columbus Freight Road, a resource eligible for the National Register. The segment is located in the Project area; however, it is recommended as a non-contributing element. Therefore, Kautz recommended that no further management considerations are necessary for these resources prior to Project implementation. This report has been submitted to the BLM for review, who agreed that cultural resources in the Project area do not require additional management actions (BLM 2009:9).

5.1.5 Native American Tribal Concerns

In accordance with National Historic Preservation Act compliance, the Walker River Paiute Tribe and Yomba Shoshone Tribe were provided with a consultation letter including a general summary of the earlier proposed project including a map (BLM 2009:7). The Yomba Shoshone Tribe deferred to the

Walker River Paiute Tribe as to whether the site posed any concern to Native American religious resources (BLM 2009). The Walker River Paiute Tribe determined that there were no Native American religious concerns within the proposed footprint. However, the tribe would be contacted in the event that human remains are inadvertently discovered during construction (BLM 2009).

5.1.6 Noise

During construction activities, there will be noise from vehicles, earth movement, and post driving. During operations, there will be some low level of noise from the electronic equipment. Motorists traveling on SR 361 may hear construction noise as they pass by. Motorists are unlikely to hear any operations noise as they pass by. Because there are no residences nearby, no noise from construction or operations is expected to directly impact any person.

5.1.7 Other Environmental Considerations

No other pertinent environmental considerations have been identified at this time.

5.2 Other Uses on the Project Site

5.2.1 Grazing Permit (grazing use, range improvements including fences and water sources and distribution, access, proposed mitigation, and any agreements with permittee)

The Project is located within the Pilot-Table Mountain grazing allotment, which encompasses approximately 520,000 acres and has an active grazing preference of 7,900 animal unit months (AUMs) (BLM 2009). By restricting access to the Project area, this would effectively remove 435.66 acres from the allotment. However, given the paucity of vegetation in the Project area, it is not anticipated that the Project would impact grazing directly. Nor would the Project require any range improvements to be removed.

The Project may have an impact on permittees if they use the Project or another nearby area for transporting animals. For example, the Luning Corral is located one mile south of the Project (see Figure 2) and has been used by allotment permittees to move cows from one side of SR 361 to the other (BLM 2009). Increased vehicle traffic during the construction period may affect permittees as they cross SR 361.

The BLM issued a policy in 2011, and restated it in the PEIS, to define the involvement of grazing permittees in the solar and wind energy ROW application process (BLM 2011b, 2012). Invenergy Solar plans to work with BLM and affected permittees to mitigate impacts in accordance with this policy.

5.2.2 Other Existing Authorized Uses (rights-of-way, leases, and permits)

There are two existing ROW grants in the Project area: the first is the NV Energy transmission facilities ROW and the second is the NDOT SR 361 ROW. Invenergy Solar will work with both permittees throughout Project development, construction and operations (see Sections 2.3 and 3.1).

5.2.3 Public Access and Roads

Access to the general public would be denied for security and safety reasons.

5.2.4 Recreation and Off-highway Vehicle Conflicts

Current recreational use within the Project boundary is believed to be low. During construction and operation, the site would be closed to recreational use for site security and for the safety of the public. There is a possibility that the Las Vegas to Reno off-road race would pass through the vicinity of the Project. Invenergy Solar would coordinate with the BLM to avoid conflicts with the race.

5.2.5 Aviation and/or Military Conflicts

The Federal Aviation Administration (FAA) is an agency of the U.S. Department of Transportation that regulates civil aviation in the United States. Based on the FAA's Special Use Airspace website mapping tool (http://sua.faa.gov/sua/siteFrame.app), there are no special or restricted airspace concerns within the Project site. The Fallon South Military Operating Airspace is approximately six miles north of the Project area.

5.2.6 Mining Claims

Per communication with BLM, there are no active mining claims within the Project boundary.

5.3 Mitigation Measures Proposed by the Applicant

5.3.1 Cultural and Historic Resources

- Any cultural (historic or prehistoric site or object) or paleontological resources or Native American human remains, funerary items, sacred objects, or objects of cultural patrimony discovered by the holder, or any person working on their behalf, during the course of activities on federal land will be immediately reported to the Authorized Officer by telephone, followed by written confirmation. The holder will suspend all operations in the immediate area of such discovery and protect it until an evaluation of the discovery can be made by the Authorized Officer.

- For cultural resources other than Native American human remains, funerary items, sacred objects, or objects of cultural patrimony, this evaluation will determine the significance of the discovery and what mitigation measures are necessary to allow the activities to proceed. The holder is responsible for the cost of evaluation and mitigation. Any decision on treatment and/or mitigation will be made by the Authorized Officer after consulting with the holder. Operations may resume only upon written authorization to proceed from the Authorized Officer.

- Invenergy Solar will inform all persons working in the Project area that knowingly disturbing cultural resources or collecting artifacts is prohibited.

- Invenergy Solar will ensure that any cultural resources discovered in the process of construction are protected by halting work within 100 meters of the discovery until the BLM issues a Notice to Proceed.

5.3.2 Native American Tribal Concerns

- For Native American human remains, funerary items, sacred objects, or objects of cultural patrimony the holder must stop activities in the immediate vicinity of the discovery and protect it from activities for 30 days or until notified to proceed by the Authorized Officer. The holder is responsible for the cost of consultation, evaluation, and mitigation. Any decision on treatment and/or mitigation will be made by the Authorized Officer after consulting with the holder.

5.3.3 Grazing

- Invenergy Solar will coordinate with the BLM and allotment holders to minimize potential conflicts with the permittees' operation of the Luning Corral.

5.3.4 Other Environmental Considerations

- Construction sites will be maintained in a sanitary condition at all times; waste material at those sites will be disposed of promptly at an appropriate waste disposal site.

- Six months prior to termination of the grant, the Authorized Officer will be contacted to arrange a joint inspection of the ROW. This inspection will be held to agree to the Project DSRP. This plan will include, but is not limited to, removal of facilities, drainage structures, or surface material, recontouring, topsoiling, or seeding.

- New infestations of invasive, non-native weeds will be treated promptly to prevent them from being spread off-site.

- Cactus and yucca plants will be avoided if possible. With BLM approval, cactus and yucca plants that cannot be avoided will be transplanted to nearby suitable habitat.

- A surface area disturbance permit will be obtained from the NDEP Bureau of Air Pollution Control to construct and operate the site in accordance with permit conditions.

6.0 REFERENCES

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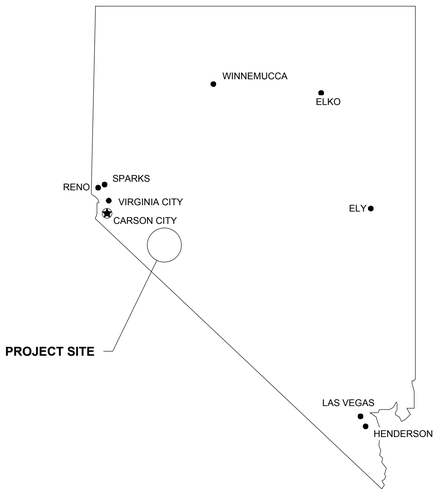
APPENDIX A. ENGINEERING AND CIVIL DESIGN

LUNING SOLAR GENERATION FACILITY

MINERAL COUNTY, LUNING, NEVADA 89420

SOLAR ELECTRIC SYSTEM PROJECT - 50.0 MWAC

PROJECT LOCATION:



PROJECT SCOPE:

SOLAR ELECTRIC SYSTEM

THIS PROJECT ENTAILS THE INSTALLATION OF A SOLAR PHOTOVOLTAIC SYSTEM. THE SYSTEM WILL BE A NET ELECTRICITY EXPORTER TO THE UTILITY GRID.

THE INSTALLATION CONSISTS OF PHOTOVOLTAIC MODULES ON A GROUND MOUNTED SINGLE AXIS TRACKING SYSTEM. THE SYSTEM WILL ALSO INCLUDE SEVERAL INVERTERS. THE PROPOSED INVERTERS ARE UL1741 LISTED FOR POWER QUALITY AND SAFETY.

THE SYSTEM WILL BE INTERCONNECTED TO AND WILL BE OPERATED IN PARALLEL WITH THE ENERGY PROVIDER ELECTRIC GRID PER THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.

PERMITTING/PLANNING NOTES:

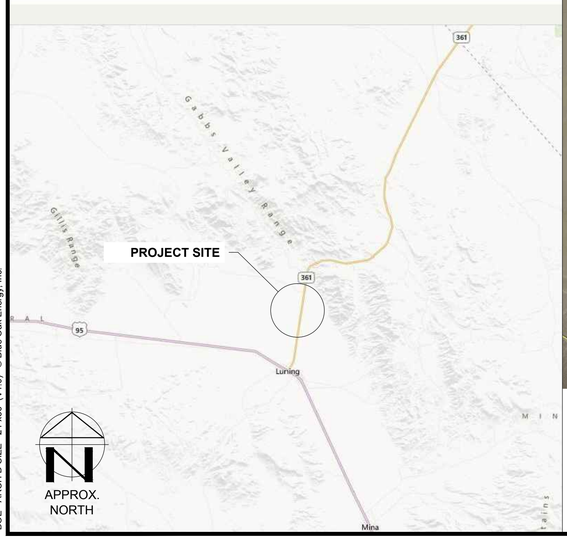
1. THIS PV SYSTEM INSTALLATION IS SUBJECT TO INSPECTION BY THE AUTHORITY HAVING JURISDICTION, INVENERGY, BLUE OAK ENERGY AND MULTIPLE OTHER STAKEHOLDERS IN THIS PROJECT.
2. THIS PROJECT SHALL CONFORM TO THE FOLLOWING CODE VERSIONS:
   - 2010 CA BUILDING CODE
   - 2010 CA ELECTRICAL CODE

   AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)
   - ASCE 7-05 MINIMUM DESIGN LOADS FOR BUILDINGS & OTHER STRUCTURES

DRAWING INDEX:

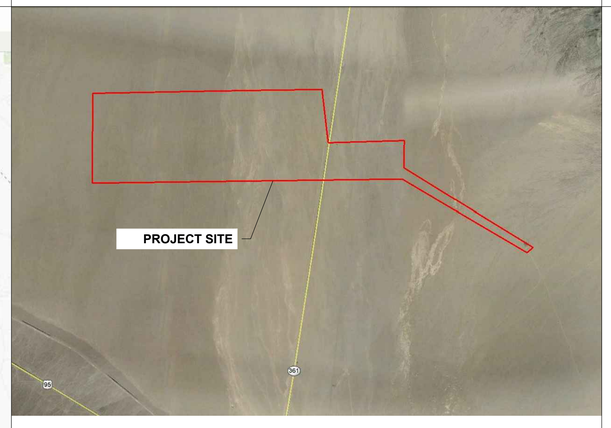
DWG #	DRAWING	REV #
WG-001	TITLE SHEET	
C-100	EXISTING SITE PLAN	
C-101	GRADING AND DRAINAGE PLAN	
W-111	ARRAY PLAN	
W-112	TRANSMISSION LINE PLAN	

STREET MAP:



APPROX. NORTH

AERIAL VIEW:



APPROX. NORTH

PROJECT TEAM:

DEVELOPER

INVENERGY
ONE SOUTH WACKER DRIVE, SUITE 1900
CHICAGO, IL 60606
CONTACT: LAURA MINER
TEL: (503) 964-8900

DESIGN ENGINEERING FIRM

BLUE OAK ENERGY
1560 DREW AVENUE
DAVIS, CA 95618
CONTACT: SAM LAUGHLIN
TEL: (530) 747.2026

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REV. NO.	DESCRIPTION	DATE	BY
-	PRELIMINARY	10.02.13	MJW

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PROJECT #:	INV0.13.001		PRINTED ON:	10/2/13	
FILE NAME:	DETL.dwg		TIME:	10:58 AM	

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1560 Drew Avenue, Davis, CA 95618
www.blueoakenergy.com - Phone: 530.747.2026

OWNER:

Invenergy
ONE SOUTH WACKER DRIVE SUITE 1900
CHICAGO, ILLINOIS 60606

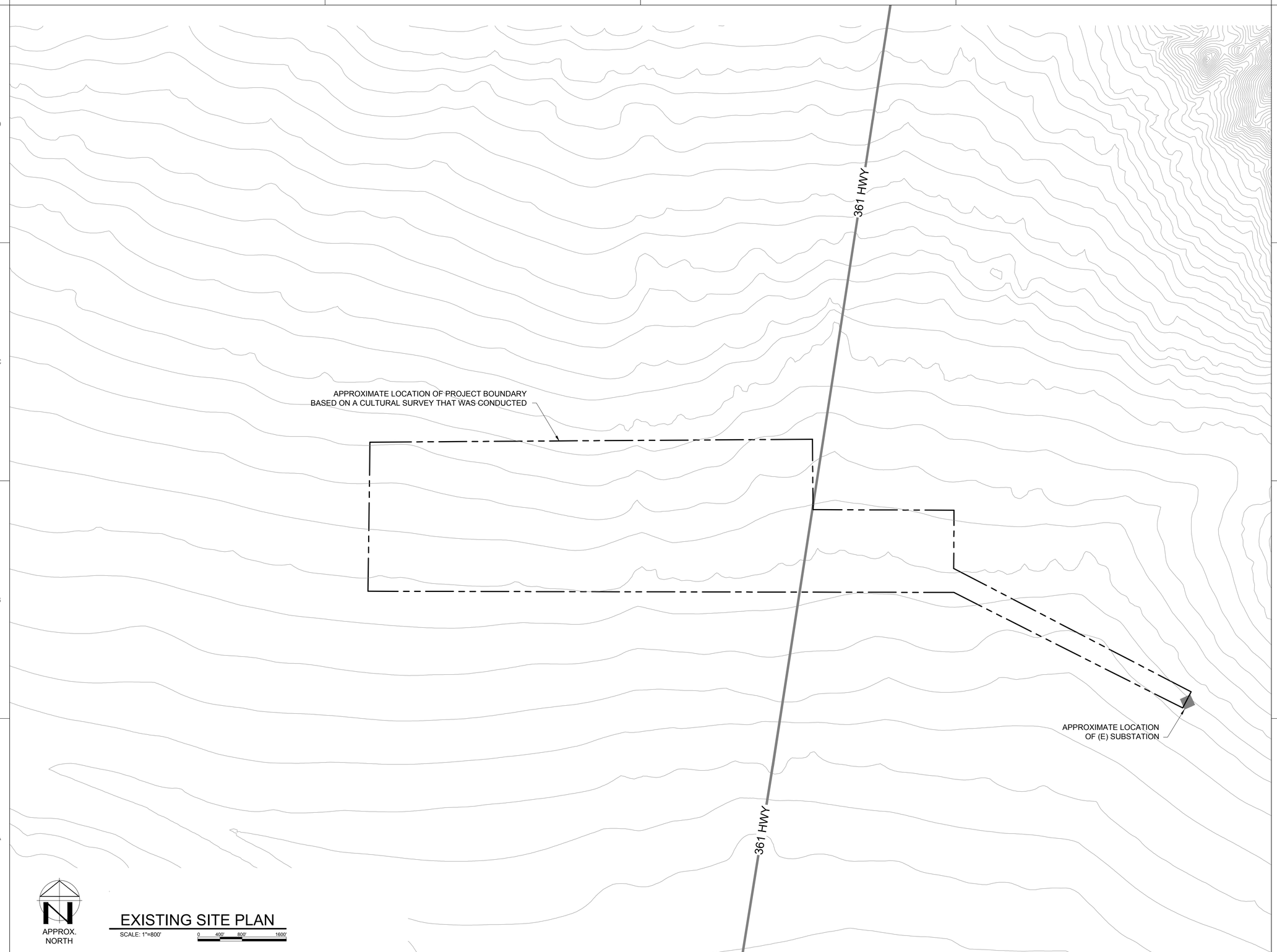
PROJECT SITE:

LUNING SOLAR GENERATION FACILITY
MINERAL COUNTY
LUNING, NEVADA 89420

DRAWING: TITLE SHEET

DRAWING NO. WG-001

BOE - ARCH D SIZE - 24"x36" (V1.0) © Blue Oak Energy, Inc.



EXISTING SITE PLAN

SCALE: 1"=800'

0 400' 800' 1600'

NOTES:

1. THE TOPOGRAPHY PROVIDED AND USED IS 5 METER CONTOUR USGS DATA.

KEYED NOTES:

1 NONE.

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OWNER:

Invenergy

ONE SOUTH WACKER DRIVE SUITE 1900
CHICAGO, ILLINOIS 60606

PROJECT SITE:

LUNING SOLAR GENERATION FACILITY

MINERAL COUNTY
LUNING, NEVADA 89420

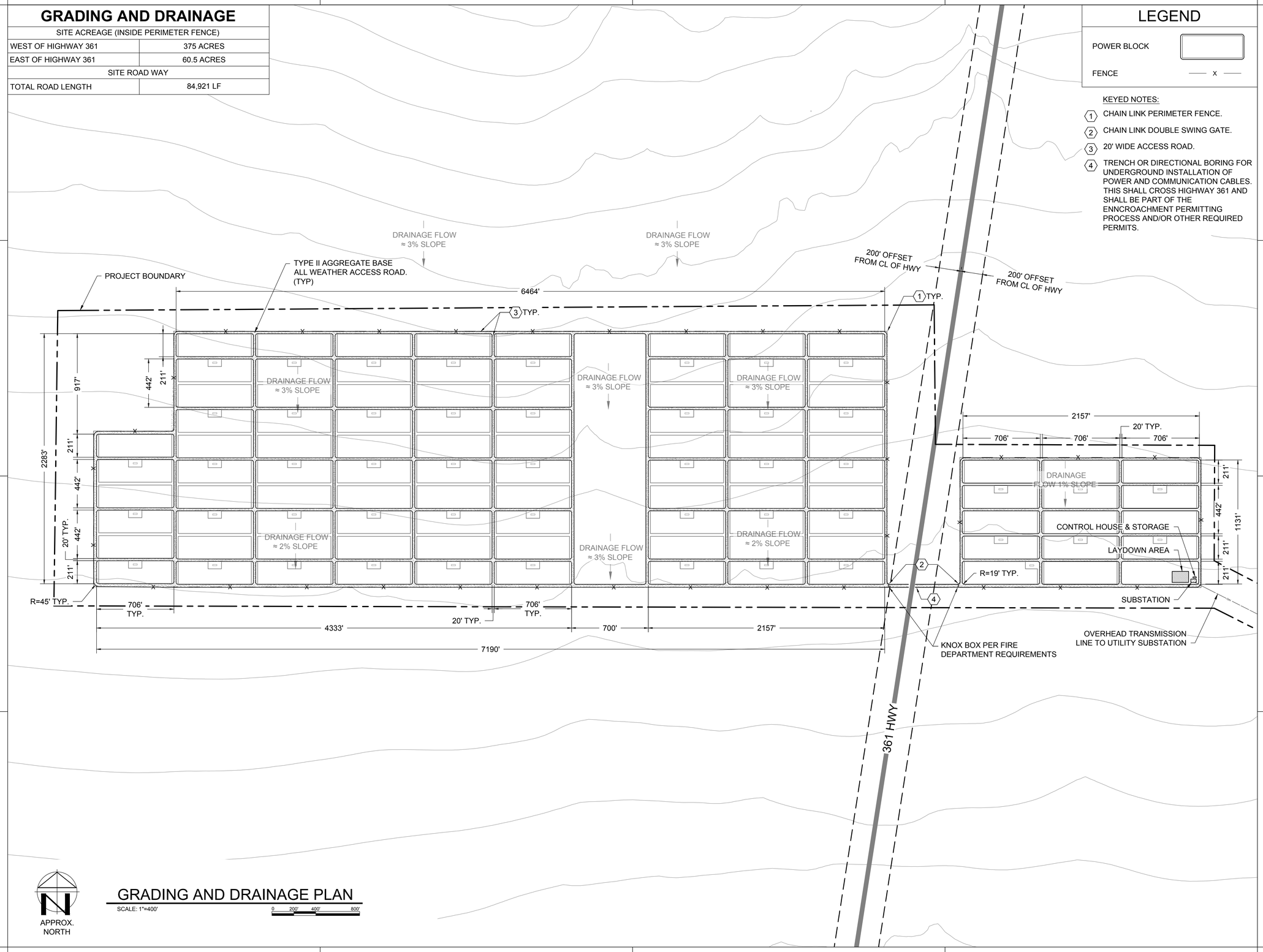
DRAWING: EXISTING SITE PLAN

DRAWING NO. C-100

BOE - ARCH D SIZE - 24"x36" (V1.0) © Blue Oak Energy, Inc.

GRADING AND DRAINAGE

SITE ACREAGE (INSIDE PERIMETER FENCE)	
WEST OF HIGHWAY 361	375 ACRES
EAST OF HIGHWAY 361	60.5 ACRES
SITE ROAD WAY	
TOTAL ROAD LENGTH	84,921 LF



GRADING AND DRAINAGE PLAN

SCALE: 1"=400'

0 200' 400' 800'

LEGEND

POWER BLOCK

FENCE — x —

KEYED NOTES:

1. CHAIN LINK PERIMETER FENCE.
2. CHAIN LINK DOUBLE SWING GATE.
3. 20' WIDE ACCESS ROAD.
4. TRENCH OR DIRECTIONAL BORING FOR UNDERGROUND INSTALLATION OF POWER AND COMMUNICATION CABLES. THIS SHALL CROSS HIGHWAY 361 AND SHALL BE PART OF THE ENNCROACHMENT PERMITTING PROCESS AND/OR OTHER REQUIRED PERMITS.

NOTES:

1. THE OVERALL HISTORICAL DRAINAGE PATTERNS ARE TO REMAIN. MINIMAL CHANGE IN FINISHED GRADE IS PROPOSED. SOLAR ARRAYS ARE TO BE INSTALLED AT EXISTING GRADE. THE INTENT OF THE PROPOSED MAINTENANCE ROAD IS TO MATCH THE EXISTING GRADES.
2. THE TOPOGRAPHY USED FOR THE GRADING & DRAINAGE PLAN IS 5 METER USGS DATA.
3. THE OFFSITE CONTRIBUTING WATERSHED IS APPROX. 20 SQ. MILES. THE FINAL OFF SITE CONTRIBUTIONS AND FLOOD DEPTHS TO BE DETERMINED DURING FINAL ENGINEERING. ELECTRICAL EQUIPMENT WILL BE RAISED ACCORDINGLY, IF NEEDED.
4. THE TOTAL PROJECT BOUNDARY IS APPROX. 628 ACRES.
5. DIMENSIONS PROVIDED ARE FOR GUIDANCE ONLY.

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PRELIMINARY NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	DATE	BY
-	PRELIMINARY	10.02.13	MJW

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PROJECT #:	INV0.13.001		PRINTED ON:	10/3/13	
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OWNER:
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CHICAGO, ILLINOIS 60606

PROJECT SITE:

LUNING SOLAR GENERATION FACILITY

MINERAL COUNTY
LUNING, NEVADA 89420

DRAWING: GRADING AND DRAINAGE PLAN

DRAWING NO. C-101

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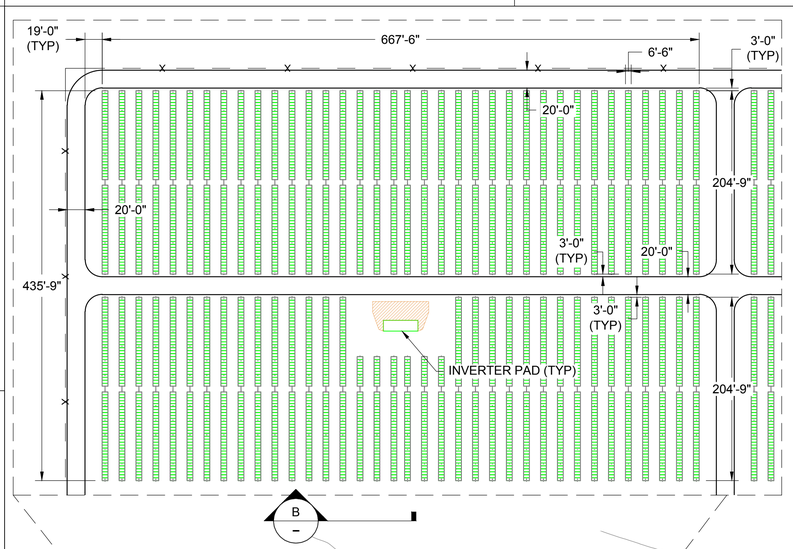

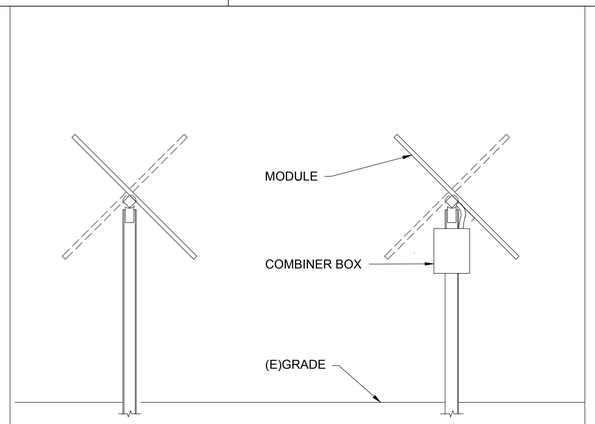

B TRACKER PROFILE
SCALE: NTS

SYSTEM SUMMARY

MODULE STC RATING	300W
TOTAL MODULE COUNT	210,000
TOTAL STC-DC SYSTEM SIZE	63.0 MW
TOTAL AC SYSTEM SIZE	50.0 MW
SITE LATITUDE	38°N
TRACKER ROW ORIENTATION	NORTH-SOUTH
TRACKER RANGE OF MOTION	±45° (FACING EAST-WEST)
TRACKER TILT	0°
GROUND COVER RATIO	33%

LEGEND

SOLAR TRACKER

SHADE PATH
(FROM 10AM TO 2PM)

FENCE LINE

A ARRAY PLAN
SCALE: 1"=400'
0 200' 400' 800'

NOTES:

1. DIMENSIONS PROVIDED ARE FOR GENERAL GUIDANCE ONLY.

KEYED NOTES:

1. TRENCH OR DIRECTIONAL BORING FOR UNDERGROUND INSTALLATION OF POWER AND COMMUNICATION CABLES. THIS SHALL CROSS HIGHWAY 361 AND SHALL BE PART OF THE ENCROACHMENT PERMITTING PROCESS AND/OR OTHER REQUIRED PERMITS.

CONFIDENTIALITY STATEMENT:

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PRELIMINARY NOT FOR CONSTRUCTION

REV. NO.	DESCRIPTION	DATE	BY
-	PRELIMINARY	10.02.13	MJW

–FOR INTERNAL USE ONLY –					
DRAWN BY:	RGD	CHECKED BY:	SPL	APPD BY:	JTG
PROJECT #:	INV0.13.001		PRINTED ON:	10/2/13	
FILE NAME:	SITE.dwg		TIME:	11:01 AM	

BLUE OAK ENERGY®
1560 Drew Avenue, Davis, CA 95618
www.blueoakenergy.com - Phone: 530.747.2026

OWNER:
Invenergy
ONE SOUTH WACKER DRIVE SUITE 1900
CHICAGO, ILLINOIS 60606

PROJECT SITE:

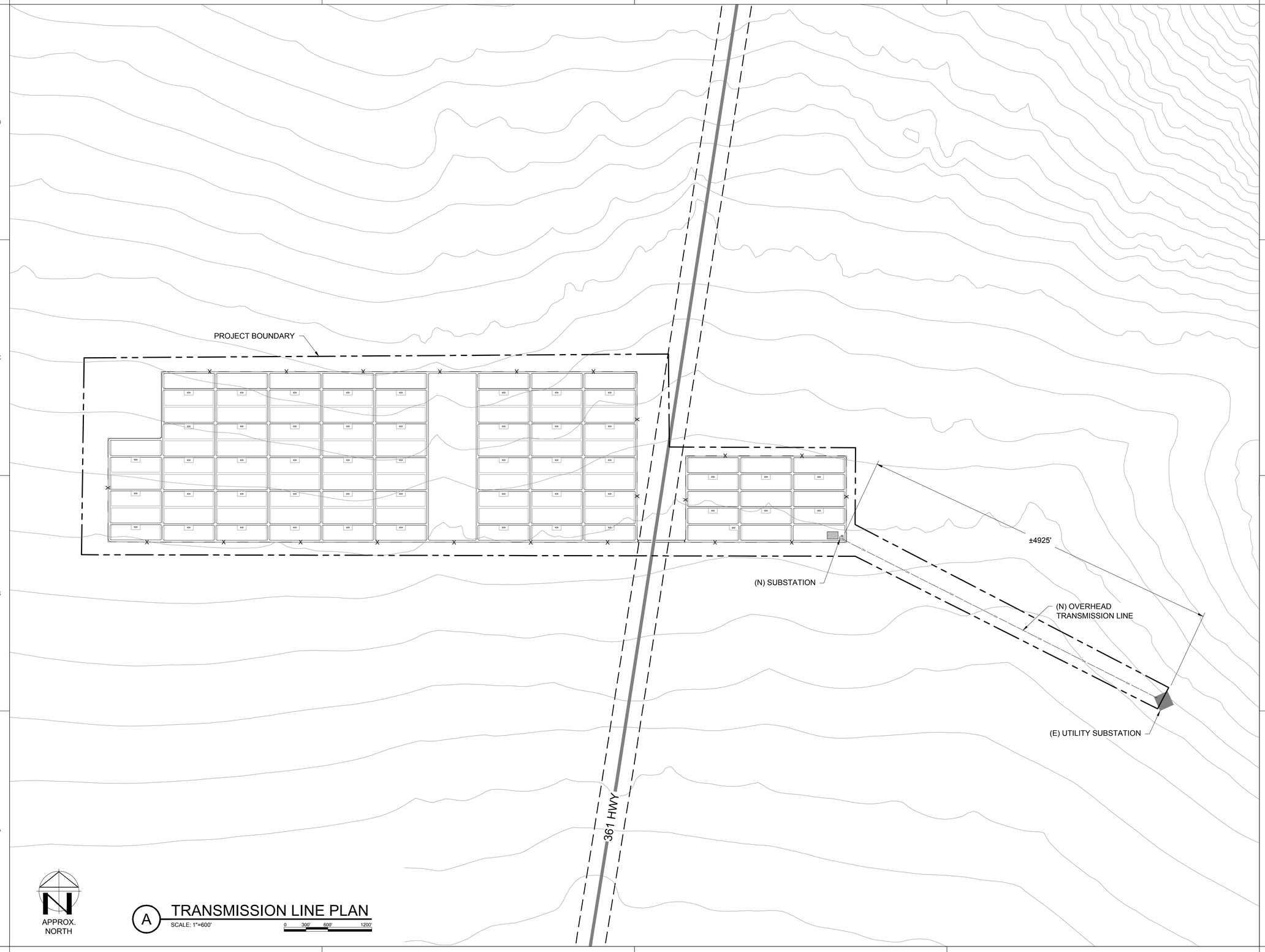
LUNING SOLAR GENERATION FACILITY

MINERAL COUNTY
LUNING, NEVADA 89420

DRAWING: ARRAY PLAN

DRAWING NO. W-111

BOE - ARCH D SIZE - 24"x36" (V1.0) © Blue Oak Energy, Inc.



A TRANSMISSION LINE PLAN
SCALE: 1"=600'
0 300' 600' 1200'

NOTES:

1. DIMENSIONS PROVIDED ARE FOR GENERAL GUIDANCE ONLY.

KEYED NOTES:

1 NONE.

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PRELIMINARY NOT FOR CONSTRUCTION

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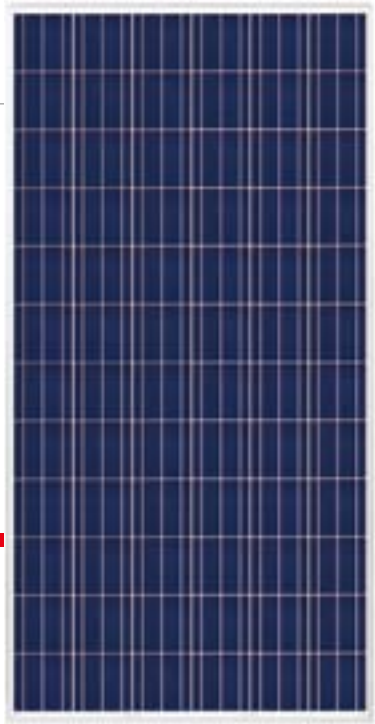
DRAWING: TRANSMISSION LINE PLAN

DRAWING NO. W-112

BOE - ARCH D SIZE - 24"x36" (V1.0) © Blue Oak Energy, Inc.

APPENDIX B. TRINA SOLAR MODULE EXAMPLE



TSM-PA14

THE UTILITY SOLUTION

15.7%
MAX EFFICIENCY

305W
MAX POWER OUTPUT

10 YEAR
PRODUCT WARRANTY

25 YEAR
LINEAR POWER WARRANTY

Module can bear snow loads up to **5400Pa** and wind loads up to **2400Pa**

Guaranteed power output
0~+3%

High performance under low light conditions
Cloudy days, mornings and evenings

Enhanced module durability with **4.0mm** thick tempered glass

Manufactured according to International Quality and Environment Management System Standards
ISO9001, ISO14001

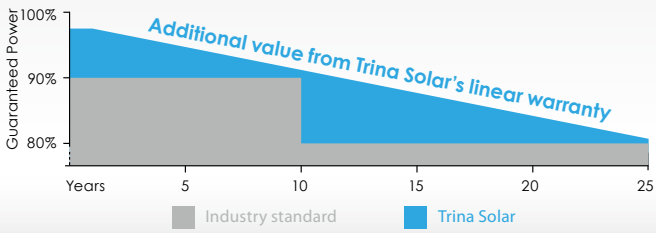
MC4 photovoltaic connectors increase system reliability

Founded in 1997, Trina Solar (NYSE: TSL) has established itself as a leader in the solar community with its vertically integrated business model. Our modules and system solutions provide clean solar power in on-grid and off-grid residential, commercial, industrial and utility-scale systems.

With more than 22 offices worldwide, Trina Solar has partnerships with leading installers, distributors, utilities and developers in all major PV markets. Trina Solar is committed to driving smarter energy choices.

LINEAR PERFORMANCE WARRANTY

10 Year Product Warranty • 25 Year Linear Power Warranty

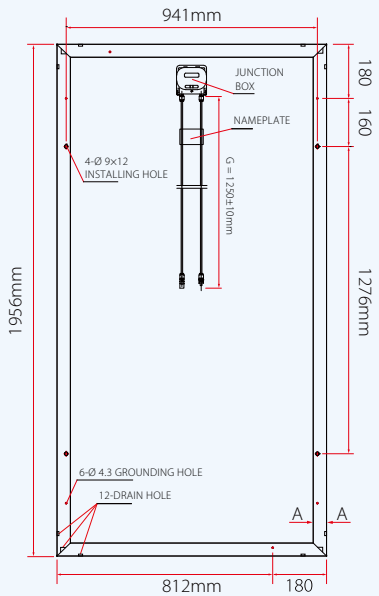


Trina Solar Limited
www.trinasolar.com

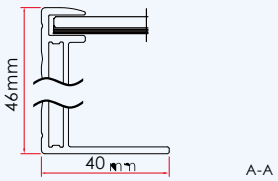
Trinasolar
Smart Energy Together

TSM-PA14 Utility Scale Solar Module

DIMENSIONS OF PV MODULE TSM-PA14

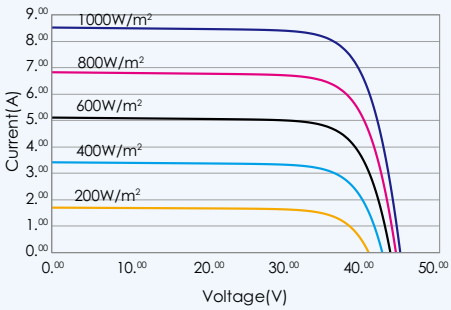


Back View



A-A

I-V CURVES OF PV MODULE TSM-290 PA14



Average efficiency reduction of 4.5% at 200W/m² according to EN 60904-1.

CERTIFICATION

ELECTRICAL DATA @ STC	TSM-285 PA14	TSM-290 PA14	TSM-295 PA14	TSM-300 PA14	TSM-305 PA14
Peak Power Watts-P_{MAX} (Wp)	285	290	295	300	305
Power Output Tolerance-P_{MAX} (%)	0/+3	0/+3	0/+3	0/+3	0/+3
Maximum Power Voltage-V_{MP} (V)	35.6	36.1	36.6	36.9	37.0
Maximum Power Current-I_{MPP} (A)	8.02	8.04	8.07	8.13	8.25
Open Circuit Voltage-V_{OC} (V)	44.7	44.9	45.2	45.3	45.4
Short Circuit Current-I_{SC} (A)	8.50	8.53	8.55	8.60	8.75
Module Efficiency η_m (%)	14.7	14.9	15.2	15..5	15.7

Values at Standard Test Conditions STC (Air Mass AM1.5, Irradiance 1000W/m², Cell Temperature 25°C).
Power measurement tolerance: ±3%

ELECTRICAL DATA @ NOCT	TSM-285 PA14	TSM-290 PA14	TSM-295 PA14	TSM-300 PA14	TSM-305 PA14
Maximum Power-P_{MAX} (Wp)	207	211	214	218	221
Maximum Power Voltage-V_{MP} (V)	32.1	32.6	33.0	33.3	33.4
Maximum Power Current-I_{MPP} (A)	6.46	6.47	6.48	6.55	6.62
Open Circuit Voltage (V)-V_{OC} (V)	40.7	40.9	41.2	41.3	41.4
Short Circuit Current (A)-I_{SC} (A)	6.93	6.97	7.00	7.04	7.17

NOCT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s.
Power measurement tolerance: ±3%

MECHANICAL DATA	
Solar cells	Multicrystalline 156 × 156mm (6 inches)
Cell orientation	72 cells (6 × 12)
Module dimensions	1956 × 992 × 46mm (77 × 39.05 × 1.81 inches)
Weight	27.6kg (60.8 lb)
Glass	High transparency solar glass 4.0mm (0.16 inches)
Frame	Anodized aluminium alloy
J-Box	IP 67 rated
Cables	Photovoltaic Technology cable 4.0mm² (0.006 inches²) , 1250mm (49.2 inches)
Connector	Original MC4 Multi-Contact MC STÄUBLI GROUP

TEMPERATURE RATINGS	
Nominal Operating Cell Temperature (NOCT)	45°C (±2°C)
Temperature Coefficient of P_{MAX}	- 0.44%/°C
Temperature Coefficient of V_{OC}	- 0.33%/°C
Temperature Coefficient of I_{SC}	0.046%/°C

MAXIMUM RATINGS	
Operational Temperature	-40~+85°C
Maximum System Voltage	1000V DC(IEC)/ 600V DC(UL)
Max Series Fuse Rating	15A

WARRANTY
10 year Product Workmanship Warranty
25 year Linear Power Warranty

(Please refer to product warranty for details)

PACKAGING CONFIGURATION
Modules per box: 24 pieces
Modules per 40' container: 528 pieces

TSM_US_Feb_2013

Trinasolar
Smart Energy Together

CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.
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APPENDIX C. ARRAY TECHNOLOGIES RACK EXAMPLE

DuraTrack™ HZ

Array Technologies' DuraTrack™ HZ single-axis horizontal solar tracker optimally balances performance with high durability, long-term reliability, and minimal operation and maintenance, to maximize the ROI for utility-scale and commercial projects.

> "The constructability of the system is a huge benefit to both the contractor installing the system and ultimately the project's developer in terms of labor cost and schedule savings."
>
> JASON LIVENGOOD & STEVE HOYE, **JE DUNN CONSTRUCTION**

SMART DESIGN

Unlike "push-pull" tracker designs, DuraTrack HZ's rotating gear-drive system does not compound wind forces through the driveline, resulting in an uncomplicated, robust solution that requires less structural material and parts.

GREATEST DESIGN FLEXIBILITY

Articulating driveline connections accommodate installation on undulating terrain and irregular site boundaries while immensely relaxing installation tolerances, reducing the risk of installation errors and increasing deployment speed.

FEWER MOTORS PER MW INCREASES PAYBACK

Designed to expedite the development of large-scale solar plants, the DuraTrack HZ high-density, low-profile system has less motors per MW making it easier to install, operate and maintain.

WIND TUNNEL AND LAB TESTED

Full-scale wind tunnel testing of the DuraTrack structure, and laboratory lifetime-tested components, results in a reliable and durable system that has proved to exceed expectations.

Array Technologies Inc.

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Albuquerque, NM 87109 USA

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E commercialsales@arraytechinc.com

W arraytechinc.com

DuraTrack™ HZ

AJO, ARIZONA – 6 MW

There are many types of terrain that present unique challenges for solar installations, but one is particularly common: sites that have uneven, undulating topography that in many cases requires extensive grading. Array Technologies' DuraTrack™ HZ system utilizes a cutting-edge, articulating driveline design that enables installation on undulating terrain, equipped with proprietary joints that can move up to 40° off angle while relaxing installation tolerances. This completely eliminates the need for extensive earthworks at naturally undulating sites such as this one in Arizona.

ABOUT ARRAY TECHNOLOGIES

Solar industry pioneer Array Technologies, Inc. is the leading manufacturer of innovative, cost-effective, reliable and robust solar tracking and racking systems. Our customers include utilities, corporations, small businesses, and homeowners. Headquartered in Albuquerque, NM for over 20 years with more than 1.7 GW of product delivered, Array Tech provides its customers with unequaled solar tracking expertise. Our ground mount solutions are manufactured in the USA and shipped worldwide.

STRUCTURAL & MECHANICAL FEATURES/SPECIFICATIONS	
Tracking Type	Single Axis
Tilt Angle	0°
kW per Drive Motor	More than 350 kW DC
Drive Type	Gear Drive
Motor Type	1.5 to 3 HP, 3 Phase, 480V AC
Motors per 1 MW	2 – 4 motors
East-West/North-South Dimensions	Site/module specific
Array Height	48" standard, adjustable
Ground Cover Ratio (GCR)	33% – 50%, flexible
Modules Supported	Most commercially available, including frameless thin film
Tracking Range of Motion	90°
Module Configuration	Single module in portrait standard, dual-in-landscape also available
Module Attachment	DuraTrack HZ high-speed mounting clamps
Materials	HDG, high-strength steel & anodized aluminum
Allowable Wind Load (IBC 2012)	Tailored to site requirements; up to IBC 180 MPH, 3-second gust exposure C
Wind Protection	None required, safety wind-stow included
ELECTRONIC CONTROLLER FEATURES/SPECIFICATIONS	
Wind Stow Device	Yes
Wind Stow Device Type	Array Tech proprietary
Solar Tracking Method	Algorithm with GPS input
Control Electronics	MCU plus Central Controller
Data Feed	MODBUS over Ethernet to SCADA system
Night-time Stow	Yes
Tracking Accuracy	+ or – 2° standard, field adjustable
Backtracking	Yes
INSTALLATION, OPERATION & MAINTENANCE	
PE Stamped Structural Calculations & Drawings	Yes
On-site Training & System Commissioning	Yes
Welding	Welded & Non-welded options available
In-field Fabrication Required	No
Dry Slide Bearings & Articulating Drive-line Connections	No lubrication required
Gear Drives	Grease once every 2 years
GENERAL	
Annual Power Consumption (kWh per 1 MW)	350 kWh per MW per year, estimated
Land Area Required per 1 MW	Approx. 5–6 acres per MW @ 33% GCR (site and design specific)
Energy Gain vs. Fixed-Tilt	Up to 25%, site specific
Warranty	5 years parts only, 10 year extended available
Made in the USA	Made in the USA from domestic and imported parts

APPENDIX D. GE INVERTER EXAMPLE

GE Energy

GE 1 MW Brilliance* Solar Inverter

fact sheet

Introduction

GE Energy's 1 MW Brilliance Solar Inverter, a grid tie solar inverter, is the latest evolution of renewables power electronics designed with the heritage of GE's proven wind turbine control design. Building on GE's expertise as a leader in the wind industry and decades of experience in controls for a wide range of utility applications, GE will soon be offering the latest power conversion technology for your large-scale solar applications.

Technical Description

Designed specifically for multi-megawatt solar projects, GE's Brilliance Solar Inverter is UL508C certified and optimized for direct connection to the grid via a Medium Voltage Transformer. With a standard voltage output of 480 VAC, GE's solar inverter requires no additional intermediate transformer, resulting in higher conversion efficiency.

Grid Friendly Features

GE's solar inverter also comes enabled with several grid friendly features that have been developed with the expertise of GE's Controls Center of Excellence.

CONTROL System

GE's CONTROL system regulates voltage and power in real time. Like a conventional power plant, it supplies reactive power to the grid when it is needed, regulating system voltage and stabilizing weak grids. GE provides a simple integrated system of Volt-Amp-Reactive (VAR) control—unlike other systems that may require add-on capacitors or VAR compensators.

Reactive Power

GE's Reactive Power feature provides smooth fast voltage regulation by delivering controlled reactive power through all operating conditions. By supervising individual inverters, it ensures that the reactive power performance can meet—and often exceed—the performance of a conventional (non-solar) power

plant. This feature can eliminate the need for grid reinforcements specifically designed for no-sun conditions, and may allow for more economic commitment of other generating resources that can enhance grid security by reducing the risk of voltage collapse.

RIDE-THRU

Our innovative RIDE-THRU technology offers Low Voltage Ride Through (LVRT), Zero Voltage Ride Through (ZVRT) and High Voltage Ride Through (HVRT) capabilities. The ZVRT package is consistent with U.S. Federal Energy Regulatory Commission (FERC) requirements. This innovative feature enables inverters to meet transmission reliability standards more stringent than those demanded of thermal power generation plants.

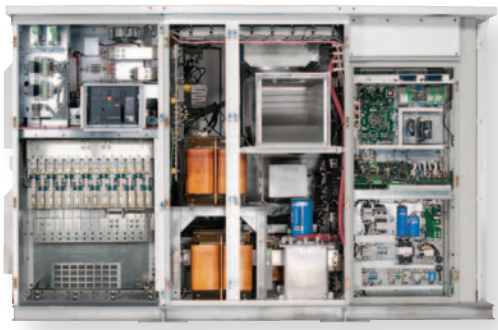
Solar SCADA System

Solar SCADA provides a broad set of intuitive tools for operation and maintenance of the solar plant. GE's Solar SCADA application is accessible from anywhere on the network. It also can be used remotely with a secure Internet connection or a telephone line. To address the ever-growing security requirements in SCADA systems, user access control is integrated into the entire system and provides an audit trail for all activity. A large set of production and maintenance reports are available to enhance the owner's ability to drive productivity across all aspects of the solar plant operation.

Technical Specifications

Output Power	Nominal AC Power Nominal AC Voltage Nominal AC Line Current Nominal Grid Frequency Nominal Power Factor	1,000 kWAC 480 Vac (+10/-5%) 1,204 Aac 50 Hz 0.99 or greater	1,000 kWAC 480 Vac (+10/-5%) 1,204 Aac 60 Hz 0.99 or greater
Efficiency	Peak Conversion Efficiency (without transformer) Weighted Efficiency (without transformer) Night Time Consumption	> 98.0† > 97.5%† (EuroETA) < 250 W	> 97.5%† > 97.0%† (CEC) < 250 W
Input Power	Input Voltage Max MPPT Voltage Range MPP DC Current Max Isc	1,000 Vdc 450-850 Vdc 2,400 Adc 3,600 Adc	1,000 Vdc 450-850 Vdc 2,400 Adc 3,600 Adc
Dimensions	Height Width Depth Weight	2,350 mm 3,400 mm 1,300 mm 4,000 kg	2,350 mm 3,400 mm 1,300 mm 4,000 kg
Environmental Design	Outdoor Enclosure Operating Temperature	NEMA 3R (NEMA 3S Bridge and Controls) -30.0 to 50.0 °C	NEMA 3R (NEMA 3S Bridge and Controls) -30.0 to 50.0 °C
Certifications and Standards		CE	UL508C CSA 22.2 #14 IEEE 519 UL 50E/CSA C22.2 #94.2 IBC/UBC Zone 4 (Seismic) IEC 60721-3-3 Class 3M3 (Sine Vibration) Ground Fault Indicator – per UL1741

Note: Efficiency measured using the CEC Weighted Average, and does not include losses of the Medium Voltage Transformer.
† 1000kw efficiency is preliminary. Cerification is in process.



For more information about GE Energy's Brilliance Solar Inverters visit www.ge-energy.com/solar

* Brilliance is a trademark of the General Electric Company.
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GEA18380 (10/2010)

APPENDIX E. PROLEC GE TRANSFORMER EXAMPLE

Three-Phase Pad-Mounted Transformers

Prolec GE offers a complete line of liquid-filled Three-Phase Pad-Mounted distribution transformers that meet applicable ANSI®/IEEE® standards.

With high voltages up to 34.5 kV and ratings up to 5,000 kVA (ONAN), Prolec GE compartmental-type Three Phase Pad-Mounted Commercial Transformers are designed for outdoor installation on a concrete pad and provide underground power distribution to commercial, industrial and institutional loads.

High-grade materials, combined with sophisticated engineering design systems, are key elements of a transformer that will deliver years of highly reliable service.

Standard Features

- 60 Hz operation.
- 65°C average winding rise.
- Radial & loop feed arrangements.
- Dead and live front type of HV terminals.
- HV BIL 45 – 150 kV (Dead Front) 200 kV (Live Front).
- LV BIL 30 – 60 kV.
- Three-point latching of low-voltage door.
- High-voltage door, which can be opened only after the low-voltage door is opened.
- Rigid steel partition.
- Transformer tank welded from cover to base.
- Permanent nameplate.
- One-inch NPT pipe cap filling provision.
- ANSI tank ground pads.
- One-inch drain valve and sampler.
- Automatic pressure-relief valve (35 SCFM).
- Tap changer with (2) 2.5% full capacity taps above and below nominal.
- One 10"x18" (or 14"x25") hand hole in transformer tank cover.
- Painted olive-green color (Munsell 7GY 3.29/1.5).
- Designed, manufactured and tested in accordance with the latest ANSI standards.

Optional Features & Accessories

- Broad selection of design efficiencies to meet specific customer applications and the new DOE efficiency requirements.
- 50 Hz.
- Type II insulating mineral oil.
- High-fire point fluid, such as silicone, hydrocarbon or vegetable fluids.
- 55° and 55°/65°C average winding rise.
- Copper and aluminum windings available.
- Dual high-voltage ratings.
- Internal expulsion fuses.
- Current limiting fuses.
- Internal oil-immersed partial range current-limiting fuses.
- Bayonet fuse holders with and without flapper.
- Non-loadbreak and loadbreak dry-well fuseholders.
- Internal oil switch (radial or loop).
- Under oil internal arresters.
- Low-voltage molded-case circuit breaker.
- Seismic Zone III and IV.
- Stainless steel tank and cabinet construction.
- Special colors.
- RUS accepted.
- Compliance with Canadian Standards (CSA).

Tests

Each transformer receives all standard commercial tests in accordance with ANSI C57.12.90 (latest revision), with test reports available by serial number of the transformer.

- Resistance tests of all windings.
- Ratio tests on the rated voltage and all tap connections.
- Polarity and phase relation tests at rated voltage.
- No load loss at rated voltage.
- Exciting current at rated voltage.
- Impedance and load losses.
- Applied voltage test.
- Induced voltage test.
- Full-wave impulse test.
- Mechanical leak test.

ANSI is a registered trademark of American National Standards Institute, Inc. IEEE is a registered trademark of the Institute of Electrical Electronics Engineers, Inc.

Standard Voltages

Standard Primary	
Voltage Ratings	Minimum BIL (kV)

Standard Ratings

Overall Typical Dimensions for Reference

For kVAs not listed, contact factory.
Dimensions and weights are approximate and subject to change without notice and should not be used for construction purposes.

APPENDIX F. GE SUNIQ SCADA EXAMPLE

Solar SCADA Features

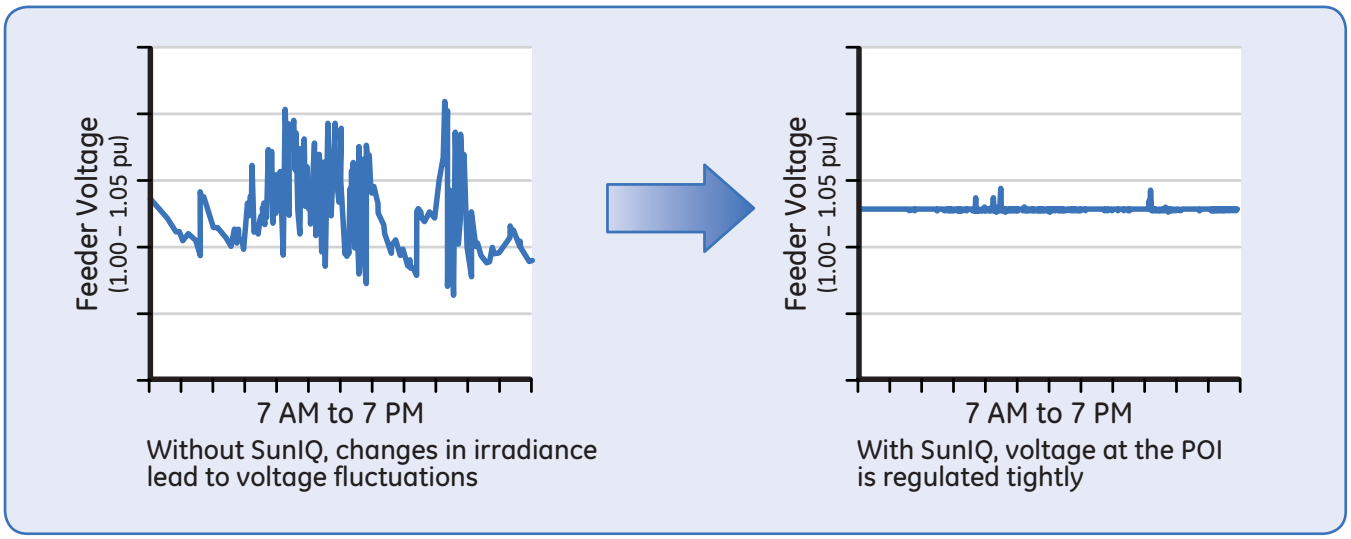
- Real-time data visualization of the plant with drill down capability
- Reporting based on historical data in SQL database
- Alarm notification via e-mail/SMS
- User configurable dashboards
- Remote troubleshooting of plant assets
- Industry standard interfaces for data access

Plant Control

The SunIQ system includes a plant level controller that coordinates behavior of multiple inverters, thus enhancing the grid integration capabilities of the Solar power plant. Like a conventional power plant, the system controls reactive power supply (KVAR) to the grid, regulating system voltage and stabilizing weak grids. The system is also capable of regulating active power (kW) providing the grid operator with the ability to curtail kW output as well as control frequency droop and ramp rate. The system can be accessed either locally or remotely via the plant monitoring system or alternatively through analog/digital I/O.

GE's system provides the following capabilities similar to those of a conventional power plant:

- **Voltage/PF control:** Regulates VARs, reduces voltage variations at point of interconnect (POI)
- **Power curtailment:** Regulates active power at the POI
- **Over frequency droop:** Reduces active power in response to frequency increase
- **Ramp rate control:** Controls MW/sec of generation change
- **Start-up/shut-down:** Avoids addition or removal of large blocks of power into/out of the grid at once



By integrating our monitoring and control system into your solar power plant, you can meet many emerging grid code requirements related to a solar plant's response.

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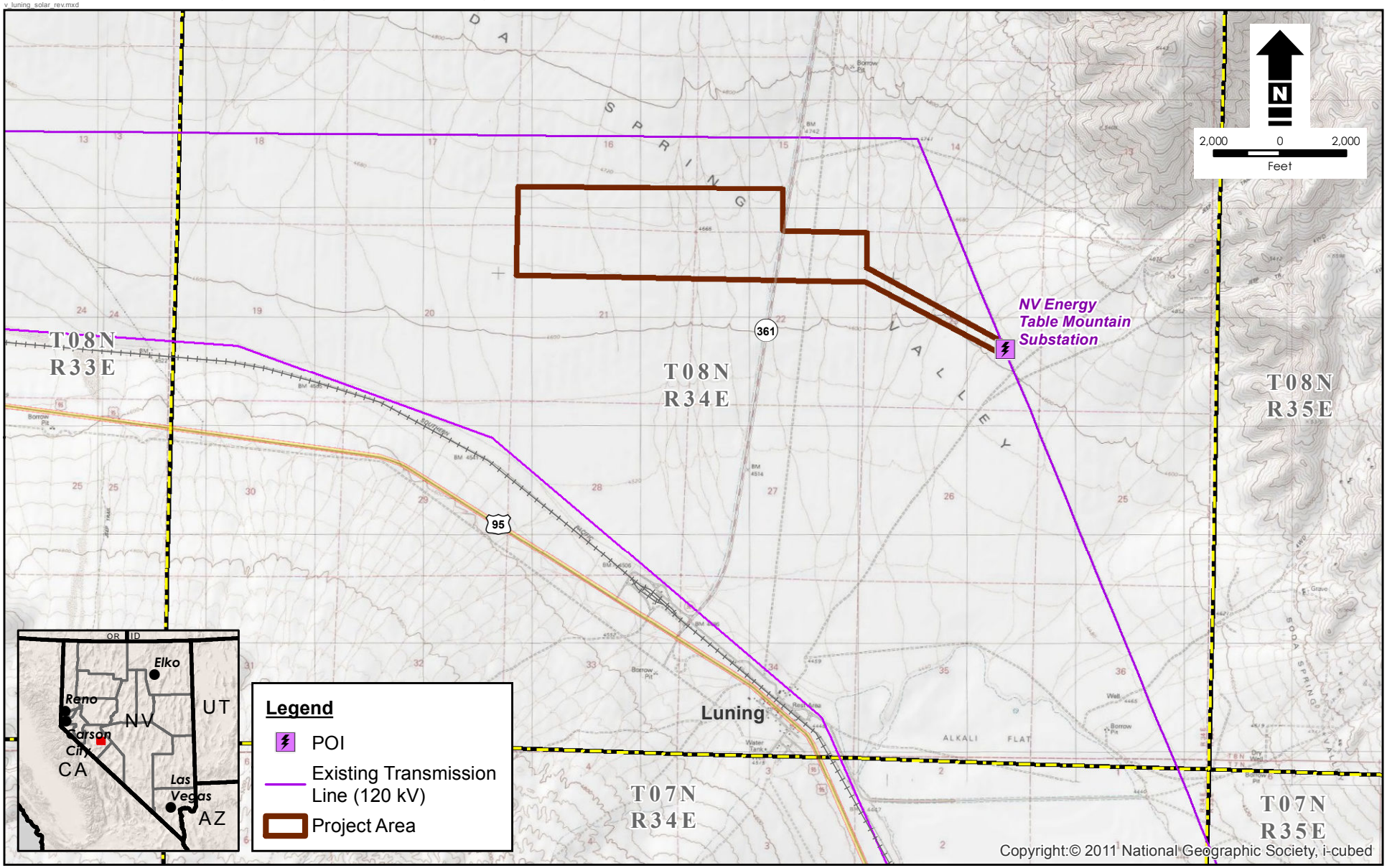

Luning Solar Energy Project

Invenergy Solar Development LLC, Mineral County, Nevada

Rev. 01

October 11, 2013

Invenergy
One South Wacker Drive Suite 1900
Chicago, Illinois 60606
(312) 224-1400

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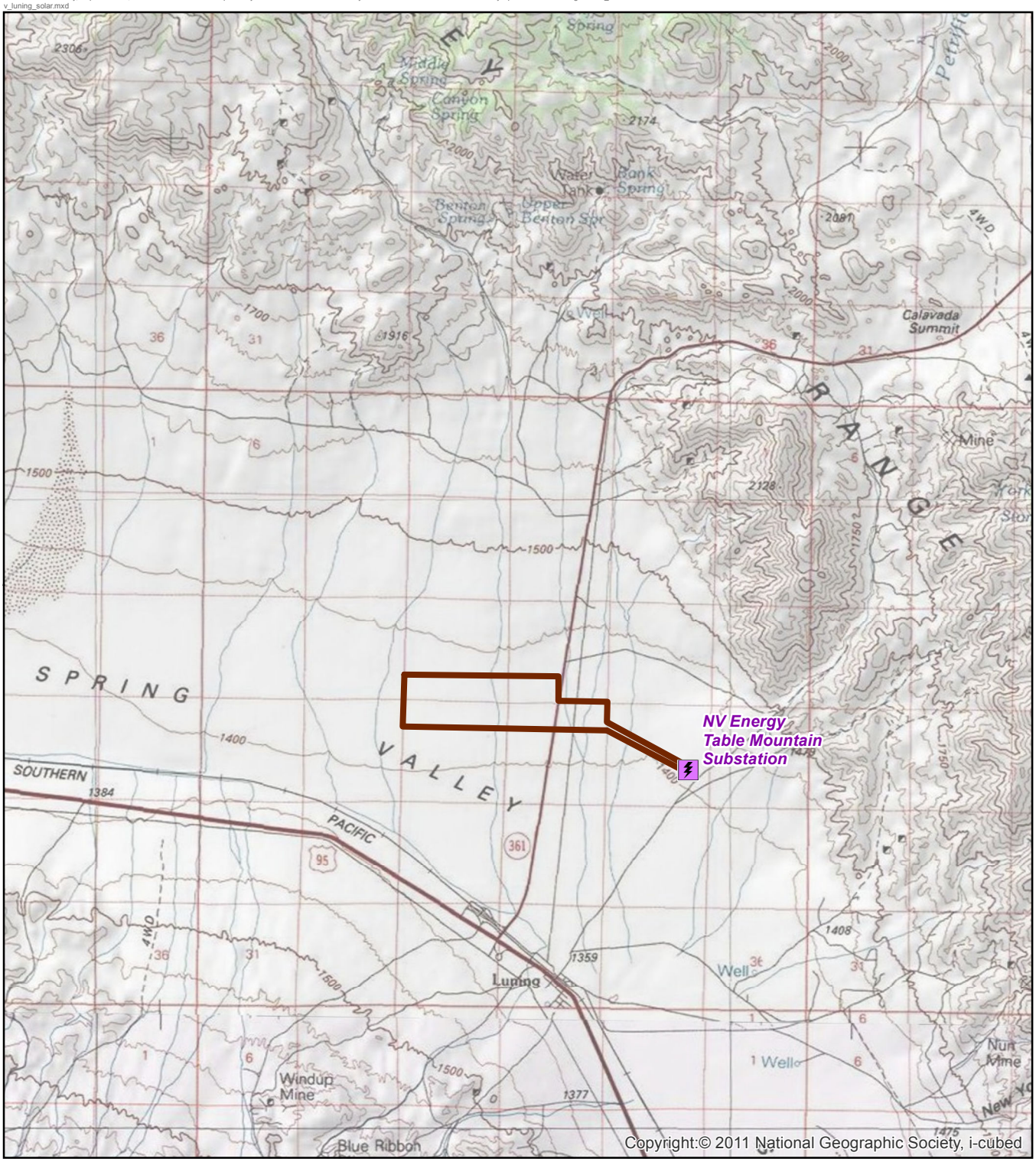


Legend

POI

Project Area

N

4,000 0 4,000

Feet

Vicinity Map – Luning Solar Generation Facility

Rev. 00

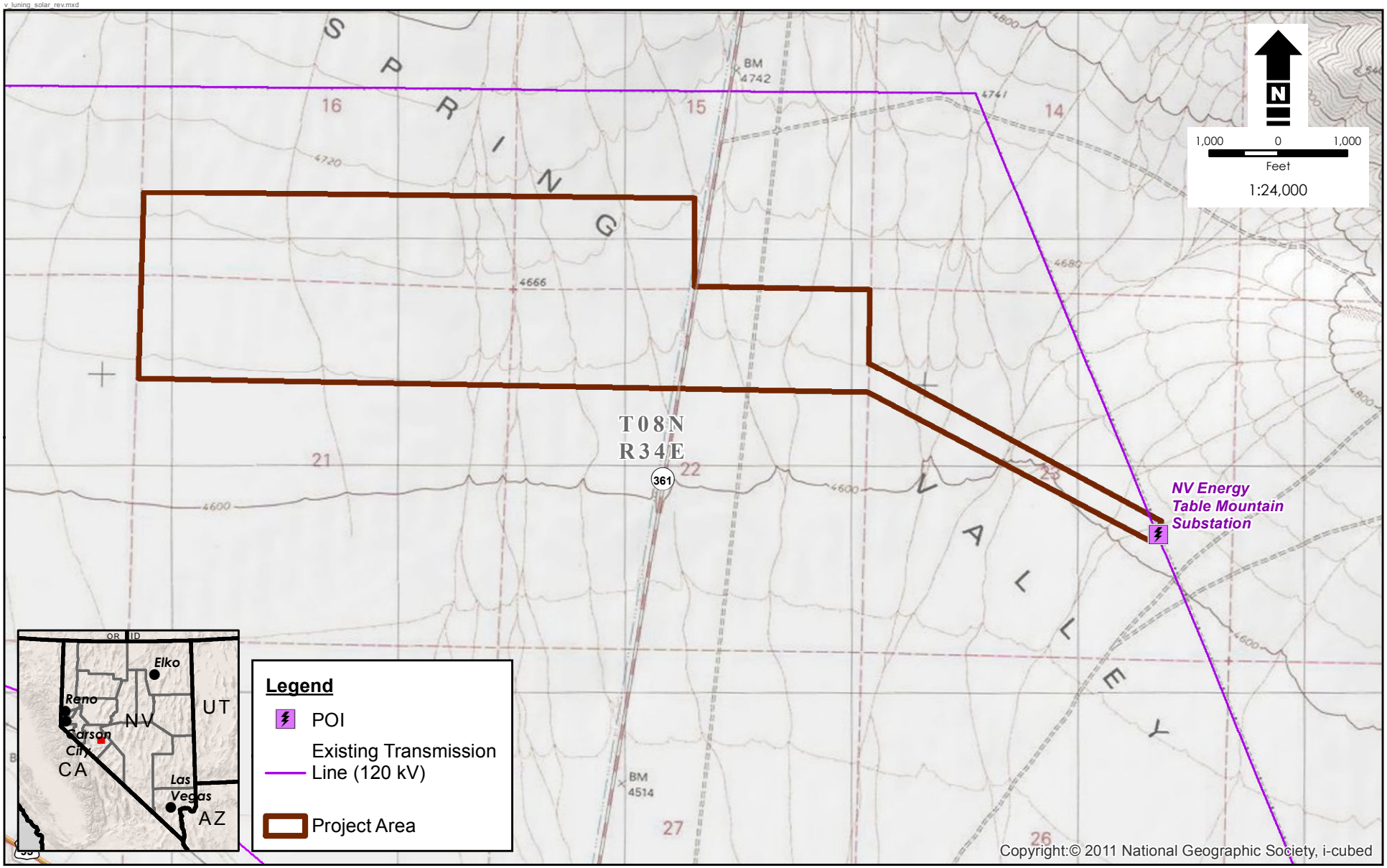
Invenergy Solar Development LLC, Mineral County, Nevada

September 24, 2013

Invenergy

One South Wacker Drive Suite 1900
Chicago, Illinois 60606
(312) 224-1400

Date Saved: Tuesday, October 22, 2013 1:14:36 PM Prepared By: KHanusiak Coordinate System: NAD 1983 UTM Zone 11N Path: \\Arcgis-db\D_MXDs\US\NV v_luning_solar_rev.mxd



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Rev. 01

October 22, 2013

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